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December 10, 2019

VIA EMAIL

Andrea Leshak
Assistant Regional Counsel
U.S. Environmental Protection Agency,
Region 2
New York Caribbean Superfund Branch
290 Broadway, 17th Floor
New York NY 10007-1866

Re: PROTECO Superfund Site in Peñuelas, Puerto Rico

Dear Ms. Leshak:

I am writing to follow-up on my letter dated August 5, 2019 in which HP set forth its position that shipments of electroplating sludge from the San German facility were not sent to the PROTECO facility for treatment or disposal and therefore do not give rise to CERCLA liability. Documents recently obtained by HP from the Department of Justice ("DOJ"), which DOJ obtained from the Computer History Museum ("CHM"), provide further support for this position. EPA has attributed to HP waste shipments from the San German facility to the PROTECO site during the period of November 1984 to September 1985. The vast majority of this waste was electroplating sludge. As explained below, records show that during this period the San German facility was sending its electroplating sludge to Europe or the mainland U.S. for reclamation of the precious metals contained in the sludge and the sludge was only stored temporarily at the PROTECO facility.

The CHM documents that HP obtained from DOJ include memoranda regarding sludge exports that state the following: "in 1984, Digital's San German entered into a contract with Amlon U.S. to export about 1,100 tons of metal hydroxide sludges to Amlon-Euromet's reclamation facilities in the U.K. and Holland. The exports were made in late 1984 after filing the necessary notices with the U.S. EPA's Office of International Affairs." (EPA-CHM0002494). The CHM documents further state that the San German facility did not export sludge to the U.K. and Holland in 1985, 1986 or 1987, because the facility had identified a more convenient and cost-effective alternative for disposition of the electroplating sludge at reclamation facilities in Arizona and Pennsylvania, (EPA-CHM0002494). The CHM documents state, "During 1985 - 1987, San German shipped its sludges to WRC's facilities in Arizona and Pennsylvania," (CHM0002497). In 1987, the San German facility reestablished its relationship with Amlon-Euromet and in 1988, the facility resumed shipment of its electroplating sludges to Amlon, (EPA-CHM0002494-5). These CHM documents are enclosed as Ex. 1.

Further support for this position is provided in the EPA/EQB RCRA Facility Assessment Report ("RFA"). The RFA was provided to EPA as Ex. 2 of HP's June 28, 2019 response and the RFA with attachments is enclosed with this letter as Ex. 2. The RFA notes that the San German facility generated a metallic sludge that was stored on-site in a 3000-gallon storage tank prior to "out-site disposal." According to the RFA, in 1983 the facility began to filter press the sludge and the resulting filter cakes were bagged and stored at the hazardous waste container storage area prior to shipping. RFA at page 4. The RFA further states that on June 29, 1984, Digital made a formal notification of its intent to export F006 metal hydroxide sludge for metals reclamation in the Netherlands. RFA at p. 7.

According to the RFA, an inspection by EPA/EQB on August 29, 1984 found that the bagged sludge destined for transport to the Netherlands had been stored at the Ponce Port in excess of 10 days in violation of 40 CFR § 262.30. The EPA/EQB inspection report states the following, "On or about September 1983 Digital contracted SCI's services to remove the electroplating sludge from the surface impoundments at Sabana Grande facility and from their plant at San German. This sludge, in a dry appearance, was packed into one cubic yard plastic bags and transported to SCI facilities at Peñuelas. ... This waste in plastic bags was stored at SCI hazardous waste storage areas on a ***temporary basis***." Exhibit No. 35 to RFA, emphasis added.

The EPA/EQB inspection report dated August 31, 1984 included a finding that the port facilities had acted as a transfer station and stored hazardous waste for more than 10 days in violation of Section 40 CFR § 262.30." Exhibit No. 35 to RFA. As noted above, the first manifest from the San German facility to the PROTECO site is dated November 1984, which is shortly after the EPA/EQB inspection report citing a violation of RCRA regulations for storage of the sludge at the Ponce Port in excess of 10 days. The logical inference is that in order to ensure that the sludge was not stored at the port in excess of 10 days, Digital requested that SCI temporarily warehouse the sludge at its facility until the sludge could be loaded onto a ship that would transport it to the Netherlands or the U.S. for reclamation.

The documents referenced in this letter are in addition to the documents previously provided to EPA indicating that the electroplating sludge was exported for reclamation. Therefore, there are multiple lines of evidence, including documents provided to HP by DOJ and documents created by EPA/EQB, supporting the position that electroplating sludge from the San German facility contained valuable precious metals and that during the relevant period, November 1984 to September 1985, was exported to Europe or mainland U.S. for reclamation. A contemporaneous EPA/EQB inspection report confirms that the sludge was stored "on a temporary basis" at the PROTECO facility.

HP respectfully requests that EPA remove the volume associated with the electroplating sludge from the waste-in list that EPA circulated to the special notice recipients on July 23, 2019. If it would be helpful to EPA, HP could provide the revised calculations. As you know, timing is critical and HP therefore requests a prompt response to this letter.

Sincerely,

Karen Davis

Karen H. Davis

KD:stj

Attachments: Exhibits 1-2

cc: Jenny McClister, jenny.mcclister@hp.com
Christopher Michael Dirscherl, christopher.dirscherl@hp.com
Christopher M. Roe, croe@foxrothschild.com

RCRA and other U.S. federal environmental laws have introduced new requirements for waste minimization as a preferred solution to the general problem of hazardous waste management (each plant must reduce amounts of hazardous wastes generated by its operations).

A related federal law, SARA Title III, requires public reporting of certain hazardous substances use and disposition data. SARA Title III will cause greater public exposure of Digital's hazardous waste management strategies (including the fact that sludge wastes are exported).

1983-1984 Exports

Starting in 1983, Corporate Energy and Environmental Affairs began investigating the feasibility of reclamation as an alternative to land disposal. In 1984, Digital's San German plant entered into a contract with Amlon U.S. to export about 1,100 tons of metal hydroxide sludges to Amlon-Euromet's reclamation facilities in the U.K. and Holland. The exports were made in late 1984 after filing the necessary notices with the U.S. EPA's Office of International Affairs.

No further Digital exports of metal hydroxide sludges occurred in 1985 - 87 because alternative U.S.-based reclamation facilities in Arizona and Pennsylvania proved to be more a convenient and competitive alternative for disposition of San German's sludges.

The Greenville plant, by comparison, has not exported any of its metal hydroxide sludges. Greenville's sludges have been disposed of at a licensed hazardous waste land disposal site in South Carolina. Increasingly tighter land disposal requirements and much higher future disposition costs, however, are causing Greenville to examine other alternatives, including exports, reclamation by third parties in the U.S., and higher level waste minimization/reclamation on site.

New Exports

In late 1987, primarily for cost/competitive reasons, the San German plant asked Corporate Energy and Environmental Affairs to assist them in re-establishing the export contract with Amlon-Euromet. Corporate Energy and Environmental Affairs visited Euromet's Wath Reclycing Facility in the U.K. in November 1987 and found it to be a sound operation, adequately financed and operating in accordance with U.K. legal and licensing requirements. In February 1988, Corporate Energy and Environmental Affairs filed the required notices with the U.S. EPA and the U.S. State Department of its intention to export hazardous waste to the U.K. [The U.S. State Department formally

transmits these export notices to the receiving government's Environmental Ministry, giving the receiving government an opportunity to veto the export]. In April 1988, Digital received clearance from the U.S. EPA to proceed with the exports. In early June, two containers of sludges (about 45 tons) were loaded on board a ship in San Juan, Puerto Rico. The sludges are expected to arrive in the U.K. in early July 1988.

The sludge management strategy would involve similar shipments every few months, at the rate of about 1,300 tons/year (includes total sludge output from San German and Greenville). These volumes will drop as Digital's waste minimization program increasingly takes effect.

Transportation and Safety

Sludges shipped for export to the U.K. are bagged, labeled as hazardous wastes, and placed in special containers before loading on a ship. On arrival in the U.K., the bagged sludges will need to be unloaded and transported in accordance with U.K. regulations governing hazardous wastes.

U.K. Metals Reclamation Facility

Euromet's Wath Recycling Facility in South Yorkshire is one of the sludges are first dried to reduce water content to about 15%. The dried sludges are then assayed and sometimes blended with other dried sludges to achieve the desired metals content specifications of a particular smelter. Sludge treatment and processing apparently does not result in hazardous residues (this is subject to confirmation). The sludges are then shipped to a smelter, for example, the Boliden smelter in Sweden. The smelting operation extracts valuable metals and leaves a glassy slag residue which is considered to be non-hazardous.

Euromet's Wath Recycling Facility has two permits from the local control authority. One is a long-term permit for the operation of the facility for metals reclamation. The second is an annually-renewable license for air discharges in connection with drying and heating operations.

Euromet is planning to expand their Wath Recycling Facility by leasing adjacent land for building a laboratory (sampling materials and assaying) and for temporary sludge storage.

Euromet is apparently a sophisticated company, with large and small customers in many countries, and good working relationships with the U.K. Ministry of Environment, the local South Yorkshire control authority in Rotheram, and with environmental agencies other countries.

Exports By Other Computer Companies

Currently, 12 or 13 U.S. companies are exporting their hazardous waste to the U.K. -- all for reclamation/recycling (primarily metals). We are attempting to determine the identities of these companies and related details. We do know that these U.S. waste exporters include several electroplaters that generate sludges. As far as we can determine, no U.S. computer companies are exporting their sludge wastes to Euromet's Wath Recycling Facility.

Metals Reclamation In the U.S.

There are several metals reclamation facilities in the U.S., including World Resources Corporation (WRC) and Boliden.

Of these, apparently only WRC is a viable metals reclaimer for Digital (the Boliden facility, located in Rhode Island, is currently engaged in litigation with the U.S. EPA).

During 1985 - 1987, San German shipped its sludges to WRC's facilities in Arizona and Pennsylvania. As with the Euromet facility in the U.K., WRC dries the sludges, sometimes blends them, and then ships them to a smelter such as Phelps Dodge. WRC also exports processed sludges to smelters in Canada and other locations.

There is increasing regulatory uncertainty over whether metals reclamation facilites such as WRC will continue to enjoy a legal exemption from the stringent regulatory requirements for facilities that "treat" hazardous wastes. If WRC and other metals reclamation facilities become subject to more stringent permitting and other regulatory requirements affecting treatment facilities, we can anticipate higher costs should we decide to use them.

Proposed EPA regulations imposing new requirements on treatment, storage and processing of sludge wastes will likely impose new regulatory requirements on smelters that process sludges for metals reclamation. As a result of these new requirements, it is quite possible that by 1989, smelters in the U.S. will refuse to accept sludge wastes for metals reclamation.

ATTACHMENT C

Questions For U.K. and European Management

1. From Digital U.K.'s perspective, what is the risk that

RCRA FACILITY ASSESSMENT REPORT

DIGITAL EQUIPMENT CORPORATION

SAN GERMAN, PUERTO RICO

PRD991291857

AIDA T. FUENTES RIVERA
EQB LAND POLLUTION CONTROL AREA
HAZARDOUS WASTE DIVISION
OCTOBER 1990

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RCRA FACILITY ASSESSMENT REPORT
DIGITAL EQUIPMENT CORPORATION
SAN GERMAN, PUERTO RICO
PRD991291857

I. Introduction

A RCRA Facility Assessment (RFA) embraces the identification of past, present or potential releases of hazardous wastes or hazardous constituents into the environment from any unit or activity that involves management of solid wastes as defined in 40 CFR 261.2 in a permitted or under interim status facility. The Assessment shall address releases of hazardous wastes or constituents to all media including soil, groundwater, surface water, air, and the generation of subsurface gas. Any release that has migrated beyond the facility boundaries shall also be considered. The ulterior purpose of an RFA will be the implementation of corrective actions where necessary as mandated by the 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) of 1976.

The present project is intended to identify the Solid Waste Management Units (SWMUs) and Areas of Concern (AOC) that could have potential or a history of hazardous wastes releases at the Digital Equipment Corporation (DEC) of San Germán, Puerto Rico (PRD991291857). SWMUs or areas for which no further action would be recommended will not be included in this report. The 12.89-acre DEC site in San Germán is an active computer circuit board manufacturing facility. It is located at the state road PR-362, Km. 1.0 Barrio Guzmán, San Germán towards the Southwest side of the Island (latitude 18° 05'28"N; longitude 67° 02'18"W). Its postal address is:

Digital Equipment Corporation de Puerto Rico
P.O. Box 106
San Germán, Puerto Rico 00753

and the local contact person for environmental affairs is:

Mr. Angel Serrano
Environmental Manager
Phone: (809) 892-1946 ext. 2574

A Solid Waste Management Unit (SWMU) is defined as "any discernible unit at which solid or hazardous wastes have been placed at any time, irrespective of whether the unit was intented for the management of solid or hazardous waste. It would include any area at which hazardous waste or hazardous constituents have been routinely and systematically released; but, it would not include accidental spills from production areas and units in which wastes have not been managed"1. On the other hand, an Area of Concern (AOC) is defined as "any area at which hazardous waste or hazardous constituents have been released but such release is not routinely and systematically done. An AOC also includes any area for which there is a suspicion that a release occurred."1

Identification of SWMUs and AOCs at Digital has been performed through a preliminary review of EQB's file and visual-site inspections.

Documentation revised during the Preliminary Review process included the following: Facility SWMU Response Letter; RCRA Permits and Engineering Section's file; Inspection, Monitoring and Surveillance Section's file; latest Permit for Emissions (PFE); and the Final Draft of the Site Inspection Report, dated August 4, 1989 from the Superfund files.

A preliminary visit was conducted on August 2nd, 1989 in order to explain the purposes and scope of the RFA process to the facility representatives and to familiarize ourselves with the manufacturing processes of the company. Also, the Facility SWMU Response letter was handed in to the company's representative.

The visual-site inspection was conducted on February 20, 1990. During the inspection, facility information was completed, company's file revised, and photos from SWMU's and AOC's were obtained. The inspection report is presented in Appendix A.

After evaluation of all the facility's information, conclusions will be presented addressing the release potential of each SWMU's and AOC's with respect to all the environmental media and further actions will be recommended.

II. <u>Facility and Process Description</u>

A. <u>History</u>

Digital Equipment Corporation started its computer circuit board manufacturing operations on July 15, 1968. The plant is located opposite to the Urb. El Convento, San Germán, Puerto Rico 00753. The site has an area of 200,000 square feet and occupies approximately 12.89 acres of land. See location map in Exhibit No. 1.

The Environmental Impact Statement 73-054 (AFE) was submitted prior to the 1980 RCRA regulations. On August 12, 1974, the Environmental Quality Board (EQB) of Puerto Rico emitted a comment regarding the document stating that the digested sludge generated from the process effluents treatment was being disposed at the San Germán Municipal Landfill. The landfill consisted of an open dump which was operating in violation to the state regulations. The open dump was adjacent to a small creek which was being reached by all the solid wastes. The EQB suggested that the disposal of sludge at the open dump had to be discontinued. The company also generated copper sulfate crystals waste.

On August 21, 1974 Mr. Ramòn Guzmán, Company's Environmental Consultant at that time, requested permission to Mr. Benjamín Cole, major of the MayagÜez town, to dispose the sludge (20,000 pounds per month) at the new MayagÜez Sanitary Landfill. On January 28, 1975, Mr. Guzmán informed to the EQB that the sludge was being disposed at the Sanitary Landfill of MayagÜez.

The company reported on the "EQB's Industrial Hazardous and Toxic Waste Study", dated January 30, 1975, the generation of three hundred and fifty gallons per month (350 gallon/month) of Sulphuric Peroxide (in a close-loop system), twelve pounds per day (12 lb/day) of Trichloroethylene, and one thousand gallon per week (1,000 gals/week) of sludge. Composition of the sludge was described as follows:

Calcium	12,300 ppm
Chromium	10 ppm
Copper	27,000 ppm
Lead	1,200 ppm
Tin	9,000 ppm
Zinc	1,800 ppm

The company also reported the generation of spent oil which was being disposed at the San Germán Municipal Landfill, although the company was planning to stored it instead. The company had a reverse osmosis treatment from which the sludge was generated. The sludge was being deposited at the Mayaguez Municipal Landfill. The company had a compaction bailer for the cardboard. They recovered/reused oil containing trichloroethylene (by distillation), Sulphuric Peroxide (by a close-loop system) and gold (by electrolysis). Refer to Exhibit No. 2 for a copy of the Industrial Hazardous and Toxic Waste Study.

On May 6, 1976, Mr. Ramòn Guzmán informed to the Puerto Rico Aqueduct and Sewer Authority (PRASA) that Digital installed an equipment to recover the copper ion from the process wastewaters being generated at the plant.

On September 30, 1976, Mr. Ramón Guzmán informed to the EQB that arrangements were made with the municipality of Sabana Grande to dispose wastes in a landfill prepared by Digital at Sabana Grande. The company started to operate the landfill in October 1976 until 1984. A closure plan was submitted on November 7, 1985 for the Sabana Grande Landfill (PRD000706333) and finally approved on December 31, 1988.

The company operates also a Container Storage Area for the management of hazardous wastes since 1973. The original Hazardous Waste Container Storage Area (HWCSA) had no roof nor secondary containment system. The HWCSA was reconstructed twice during the years of 1981 and 1983. Since the unit did not comply with the 50-feet property line requirements, another Container Storage Area was habilitated in 1987 for solely storage of ignitable wastes. A closure plan was submitted on November 16, 1988. The first revised Closure Plan was then submitted on October 9, 1989 from which a Notice of Deficiencies (NOD) has been issued in September 1990.

The company operates a Wastewater Treatment Plant (WWTP) since 1968. From the WWTP, a metallic sludge is generated. The sludge was stored on-site in a 3,000 gallon storage tank located at the WWTP prior to out-site disposal. In 1983, the sludge started to be filtered-press and the generated filter cakes containing the dewatered metallic sludge bagged and stored at the HWCSA prior to shipping. The WWTP was modified in 1988 in order to comply with the new pre-treatment regulations of the Puerto Rico Aqueduct and Sewer Authority (PRASA).

The company had four (4) underground tanks for the storage of diesel. However, the four tanks were removed in 1988 and two (2) aboveground storage tanks were placed instead at the same area. The company performed a remedial action at the site in order to remove soil contaminated with hydrocarbons. The remedial action ended in the summer of 1989. The Underground Injection Control (UIC) Permit No. 84-0018 is still in force since declassification will be subject to the EQB approval and acceptance of the remedial actions.

B. Regulatory History

February 18, 1990 89	Digital Equipment Corp., San Germán submits the "Industrial Waste Survey" to the Environmental Quality Board. Refer to Exhibits No. 3 for a copy of the survey.

August 18, 1980	Original Notification of Hazardous Waste Activity is received. The company notifies as a generator (G) and treat/store/dispose (TSD) facility. The hazardous wastes generated are identified as F001, F002, F006, F007, F008, F009, D001, D002, and D000. Refer to Exhibit No. 4 for a copy of the original notification.
November 19, 1980	Original Part A permit application is received. The company is identified with a temporary EPA Id. No. PRT00040543. The facility describes the processes being used as S02 (tank), 52,000 gallons, and S01 (container), 5,000 gallons. Refer to Exhibit No. 5 for a copy of the original Part A.
March 10, 1981	Full RCRA Generator Inspection. The company generates a metallic sludge, 8,000 - 10,000 gallon/week approximately. The sludge is stored in a tank at the company's Wastewater Treatment Plant prior to out-site disposal in the Sabana Grande Landfill. The sludge is collected from the tank three times per week. EQB has not received any manifest copy from the company. The sludge storage area at the Sabana Grande Landfill does not comply with any federal and/or state requirement.
September 16, 1981	RCRA Generator Inspection. The company has about 40 drums of waste flux oil which was tested and found to be EP toxic because lead (Pb) concentration. Refer to Exhibit No. 8 for a copy of the Inspection form. The company violates 40 CFR 265.15 regarding a written schedule of inspections. Refer to Exhibit No. 9 for copy of the EPA letter informing the violation.
March 12, 1982	Digital makes a delisting petition for its F006 sludge.

March 16, 1982	A Part A Permit Revision Inspection. Digital has a state air permit PFE-38002141-II-0. The company does not use drums to store hazardous waste normally; they have a storage area with a capacity to hold 95 fifty-five gallon drums in case of an emergency or spill. They have two storage tanks with a combined maximum capacity of 9,000 gallons. They were storing, up to February 1982, an unreported waste of waste oils labeled as toxic. Refer to Exhibits No. 7 for a copy of the report.
May 11, 1982	Full RCRA Interim Status Inspection. The storage area is fenced and divided to segregate the wastes but it does not have spill control system and roof. There is no inspection logbook or internal record of the wastes. Some raw material are stored with the wastes. The containers are not properly labelled. Some drums are opened specificaly the containers with cooper sulfate. Refer to Exhibit No. 10 for a copy of the Summary of Findings.
August 19, 1982	EPA assigns the identification number PRD991291857 for the company.
March 24, 1983	Accidental spillage of process water through the Board Shop floor to the underlying soils.
November, 1983	Digital submits a Geohydrologic study in order to assess the extent of on-site groundwater contamination due to the accidental discharge of process water from the Board Shop. The company installs a series of trenches and a collection well to control the seepage (remedial actions).

December 19, 1983	Digital established a monitoring sampling program as part of the remedial actions, namely: a bimonthly sampling of DEC well #3 and a weekly sampling of the collection well. Parameters to be monitored are cooper, nickel, chromium and lead. Refer to Exhibit No. 6 for a copy of the letter.
June 29, 1984	Digital makes a formal notification of its intent to export F006 metal hydroxide sludge for metals reclamation in the Netherlands.
August 29, 1984	EQB/EPA Inspection to Servicios Carbareòn, Inc. (SCI) PRD #91-01-8622 and the Ponce Port facilities where the ship "Seaport-Peder-Most" was anchored and receiving hazardous waste from Digital Corporation. At the time of the inspection this ship did not have an EPA I.D. number as required by 40 CFR 263.11; therefore, it was in violation of this section. Also, it has stored wastes in excess of 10 days in violation of section 40 CFR 262.30 and of 40 CFR Parts 270, 264, and 265. Refer to Exhibit No. 35 for a copy of the inspection report.
June 14, 1985	Part B pre-submittal meeting and facility inspection. A filter-press was installed at the Wastewater Treatment Plant in October 1983. The Sludge Holding tanks appear to be exempt. Prior to the filter press, the watered sludge was being disposed at the lagoons in the Sabana Grande Landfill. The company closed the surface impoundments without a closure plan. Therefore, there is a violation to 40 CFR 265.112(c). Also, there is a violation to 40 CFR 265.90 due to failure of the company to install a groundwater monitoring system at the lagoons.
December 15, 1985	The company submits a revised Part A permit application. They include the hazardous wastes F006, F002, D008, D001, and the process code S01 (containers).

May 6, 1986

Full RCRA Inspection. The Container Storage Area has had two reconstruction during the years of 1981 and 1983. The reconstructions seem to exceed the 50% of the original area, but the company has not amended the Part A permit application. The company incurs into the following violations:

Class I Violations:

Rule 704 (B) / 40 CFR 262.31
704 (C) / 40 CFR 262.32
812 (D) / 40 CFR 265.173 (b)

Class II Violations:

Rule 807 I / 40 CFR 265.13 (b)
803 F / 40 CFR 265.15
810 F / 40 CFR 265.35
810 G / 40 CFR 265.37
207 / 40 CFR 265.52 (e)
704 D / 40 CFR 262.34 (a) (2)
812 B (5)
502 (A)

The company is referred to the EQB's Legal Division for an enforcement action.

May 9, 1986

The company submits another revised Part A permit application. They include the hazardous wastes F006, F002, D008, D001, F001. The company has a UIC permit No. 34-0018 and a state air permit No. PFE 64-0485-I-I-I-0.

July 10, 1986

The company submits a revised Notification of Hazardous Waste Activity. They notifies the hazardous wastes F006, F002, D008, and D001.

January 23, 1987	Digital reports an accidental spillage of diesel. The incident occurs on October 8th, 1986 when a one-inch pipeline from the underground storage tanks and connected to a 300 gallon aboveground storage tank broke down. Refer to Exhibit No. 11 for a copy of the report.
January 27, 1987	Digital submits to EPA the Hazardous Wastes Questionnaire.
February 2, 1987	Digital reports a spill of wastewater at the process waste treatment plant on January 25, 1987. Due to a faulty check valve, five-thousands (5,000) gallons of wastewater overflow one tank and enter the company's storm sewer system which is connected to a ditch receiving storm waters at the Puerto Rico Road #360. The wastewaters were removed from the ditch.
February 24, 1987	Digital submits to EQB a technical report about the heavy metal content of water and soil samples from the rain natural ditch of PR Road #360 (incident January 25, 1987).
March 16, 1987	Order To Do and Show Cause, DL-87-004-006 regarding inspection performed on May 6, 1986. The following fines are proposed:

Violation	Proposed Fine
Rule 704-B	$499.00
704-C	499.00
812-C	499.00

Refer to Exhibit No. 12 for a copy of the Order.

April 10, 1987	EQB inspects areas of the diesel and wastewaters accidental spills. The soil impregnated with diesel has been removed and ready to be disposed as non-hazardous waste. The wastewater collected from the stormwater ditch has been used for cool down.

June 30, 1987	Full RCRA Inspection. The company is found to be in violations to Rule 812-B/40 CFR 265.176 (storage of ignitables wastes 50 feet away from property line). The company incurs in a Class I violation and it is referred to the EQB's Legal Division foran enforcement action.
September 14, 1987	Digital consults the EQB in regard to the proper disposition of the off-specification circuit board containing lead.
November 10, 1987	Digital requests to both the EQB and the EPA permission to export F006 sludge to United Kingdom for metals reclammation.
November 20, 1987	EQB inspects the new area that has been habilitated by the company for the storage of ignitable wastes. One side of the storage area is 60 feet away from property boundary and the others three sides of the area are 86 feet away from property boundary. The deficiency found on June 30, 1987 has been corrected.
December 2, 1987	EQB approved the company's petition to export the F006 sludges for metal reclammation.
January 7, 1988	EQB responds to Digital request for orientation in regard to the proper classification of circuit boards containing lead. EQB informs to the company that because the circuit boards generated at Digital are being transported for lead reclammation, the transportation of said waste is not subject to the manifest requirements. Refer to Exhibit No. 14 for a copy of the response letter.
February 25, 1988	An accidental spill of concentrated Sulphuric Acid occurs at Digital Equipment Corp., San Germán. Near 56 gallons of concentrated Sulphuric Acid spill on the floor at the building no. 2 exterior

loading/unloading chemical ramps platform area. The soil was neutralized and removed. Soil surface samples were taken and analyzed for pH. Refer to Exhibit No. 13 for a copy of the report.

May 2, 1988	Full RCRA Generator and TSDF inspection. The company is found to be in compliance with the minimum requirements of the applicable regulations. Refer to Exhibit No. 15 for a copy of the Inspection Report.
May 25, 1988	Order To Do and Show Cause, DL-88-004-007 (Resolution and Notification). EQB emits an order to the company on February 8, 1988 because during an inspection performed on June 30, 1987, Digital was found to be in non-compliance with Rule 704-D(1)(b)(3) (storage of ignitables wastes at less than 50 feet from the property line). On May 5, 1988, EQB and Digital agree that the area for storage of ignitables wastes has been relocated and it now complies with Rule 704-D(1)(b)(3). Nonetheless, Digital has to pay $1,000.00 to cover process expenses. Refer to Exhibit No. 36 for a copy of the order.
June 8, 1988	Digital informs the EQB that the company has eliminated the use of chromic acid at the Wastewater Treatment Plant. The company uses instead Potassium Permanganate as an oxidizer.
October 27, 1988	An accidental spill of spent etcher solution occurrs at Digital Equipment Corp., San Germán. Refer to Exhibit No. 16 for a copy of the report.
November 16, 1988	Digital submits the Closure Plan for its Container Storage Area.

December 16, 1988	EQB approves that the company proceed to dispose the fuel-impregnated soil from its underground storage tanks area into either the Hormigueros or MayagÜez Municipal Landfill. Refer to Exhibit No. 17 for a copy of the approval.
April 26, 1989	Full RCRA and Land Ban Inspection. The company is found to be in compliance.
May 3, 1989	Digital reports an accidental spillage of Sulphuric Acid occurred on May 1, 1989 at the Digital's Building #6 stock room 186 area. Refer to Exhibit No. 18 for a copy of the report.
May 10, 1989	Digital submits a Remedial Action Plan for the SGO's underground tank area. Refer to Exhibit No. 19 for a copy of the plan.
May 25, 1989	Digital informs agreements made with the EQB during a telephone conversation on May 18, 1989 in regards to the Remedial Action Plan. Refer to Exhibit No. 20 for a copy of the letter.
June 19, 1989	Digital reports an accidental spillage of "Ammoniacal/Copper Bearing Solution" occurred on June 14, 1989 at Road #362 intersection 119. The spilled quantity was five gallons (49 lbs.) and it was neutralized.
October 9, 1989	Digital re-submits the Closure Plan for the Container Storage Area.
November 13, 1989	EQB issues the permit for emission no. PFE-64-0485-0348-I-II-(0). The permit expires on November 13, 1991. Refer to Exhibit No. 22 for a copy of the permit.
November 20, 1989	Digital submits a revised part A permit application signed on October 27, 1989. Refer to Exhibit No. 21 for a copy of the form.

January 24, 1990	EQB issues the permit for emission No. PFE-LC-RM-64-0190-0046-I-II-0. The permit expires on January 24, 1992. Refer to Exhibit No. 23 for a copy of the permit.
October 8, 1990 for	EQB issues a Notice of Deficiency (NOD) the revised Closure Plan submitted on October 9, 1989.

C. PRESENT FACILITY OPERATIONS

Digital Equipment Corporation performs two main processes at its San Germán facility. These are: the manufacturing of the printed circuit boards (PCB) using a chemical process, and the module assembly.

Printed Circuit Boards

1. Inner Layer Process:

   a. The raw materials are: copper foil, and 18" x 24" Fiberglass layers.

   b. The copper foil is scrubbed with a 10% solution of sulphuric acid and rinsed with water.

   c. A nine to ten fiberglass layers group is drilled with a press. An inner layer (the nine to ten fiberglass layers group) is pre-prepared with the copper foil.

   d. An image is applied onto the inner layer by means of an Ultraviolet (UV) light and an acrylic.

   e. The image is developed using an ultraviolet (UV) developer made of Soda Ash and water.

   f. An etcher solution consisting of Ammonium Chloride and Ammonium Gas is used to remove the copper on the pre-prepared inner layer. The previously applied image remains on the layers.

   g. Stripping with monoethanolamine is performed to remove undesirable film on the layers.

   h. A Brown Oxide solution is used for the oxidation of the layers surface. The layers are rinsed with an acidic media, Sulphuric Acid, 10%

i. The pre-prepared inner layer is compressed using a press. A printed circuit board (PCB) is produced and a metal scrap generated.

2. <u>Drilling Process:</u>

a. The PCB is drilled at the original holes.

b. The PCB's drilled holes are cleaned into a Potassium or Sodium Permanganate bath.

c. The PCB is inspected on an X-Ray machine.

d. A Copper solution is deposited onto the holes walls by means of an electroless process in order to improve the conductivity of the PCB. Formaldehyde is used as a catalytics for copper deposition.

e. The boards are examined by cross-section.

f. A lines image is applied onto the PCB using a dry film.

g. The boards are electroplated with copper, lead, tin and nickel. Sulphuric and Fluoboric acid are used as acidic media for the metals baths. Hydrogen Peroxide is used for cleaning purposes. The tin and lead solutions are polished prior to enter the electroplating process in a close-loop Carbon Treatment unit at the Electroplating Area.

h. The boards are microplated first with nickel and gold afterwards.

i. In order to protect the boards from scratches or dirt, the boards go through either one of two final processes, namely: the Solder Mask process, or the Dry-Film Solder Mask process. In the Solder Mask process, a paste is applied onto the boards. In the Dry-Film Solder Mask process, a dry film is instead applied onto the boards. Acetone and 1,1,1-trichloroethane are used for cleaning purposes during the Solder Mask and the Dry-Film Solder Mask processes, respectively.

<u>Module Assembly</u>

1. The raw materials are the printed circuit boards (PCB) manufactured through the aforementioned chemical processes at the Printing Circuit Facility (PCF).

2. The necessary electronic components are assembled to the PCB either manually or mechanically.

3. The electronic parts can be welded from the bottom by using a "Wave Soldering Machine" and a melting paste.

4. Also, the electronic parts can be welded on top of the board by using a new technology known as Surface Mount Technology (SMT) and a solder paste containing lead and tin. The boards are degreased using Methylene Chloride.

D. Identification of All Waste Streams

Following is a description of all the waste streams from the point of generation through their ultimate disposition.

Wastewaters

The wastewaters are generated from rinsing during the manufacturing processes.

During the manufacturing of the printed circuit boards (PCB), the rinsewaters are generated at the following processes (refer to the manufacturing description on the Part C of this report):

Step 1b: Acidic rinses from the washing of the copper foil. The rinsewaters are directed to the company's Wastewater Treatment Plant through the trenches system located at the Inner Layer Room.

Step 1h: Acidic rinses from the washing of the oxidized layers. The rinsewaters are directed to the company's Wastewater Treatment Plant through the trenches system located at the Surface Treatment Room.

Step 2b: Basic rinses from the cleaning baths. The rinsewaters are directed to the company's Wastewater Treatment Plant through the trenches system located at the Drilling Room.

Step 2d: Rinses from the Copper Sulfate solution baths. The rinses used to be discharged to the company's Wastewater Treatment Plant (WWTP). At present, the cooper sulfate crystals waste generated during the electroless process is being recovered with a close-locp filters system. Therefore, the rinsewaters are currently reused and not discharged to the WWTP.

Step 2g: Electroplating rinses. Usually there is no generation of wastewaters from the electroplating baths and the close-loop Carbon Treatment unit due to water recirculation. However, both areas are surrounded by a trenches system connected to the company's Wastewater Treatment Plant for any event.

Step 2h: Spent potassium cyanide solution from gold microplating. Formerly, the spent cyanide solution was disposed as an F007 waste. However, as part of its waste minimization program, the company installed a gold recovery unit in 1984-1985, therefore the spent cyanide solution is sent to the company's Wastewater Treatment Plant.

Solid and Hazardous Wastes

During the manufacturing of the printed circuit boards (PCB) and the modules assembly, the following solid and hazardous wastes are generated from specific processes steps (refer to the manufacturing description on the Part C of this report):

1. Ammoniacal Copper Bearing Solution, D002 Waste

Generation: It is generated at step 1f during the etching of the inner layer.

Storage: The spent etchant solution and the rinsewaters are stored each at two tanks that feed the Mecer Unit (i.e., the etchant recovery system), SWMU1.

Treatment: The ammoniacal Copper Bearing Solution is treated in the Mecer Unit in order to regenerate the etchant solution and recover the copper.

Disposal: The regenerated etchant solution from the Mecer unit is stored in a 9,000 gallon tank for reuse in the manufacturing process. The recovered copper is sold.

If the Mecer Unit is down, then the D002 waste is collected from SWMU1 into a tank truck and sent to CP Chemical, South Carolina for copper reclammation.

2. Metal Scrap

Generation: It is generated at step 1i during the production of the PCB's.

Disposal: The metal scrap is sold.

3. Cooper Sulfate Spent Filters, D002 Waste

Generation: It is generated from the close-loop filters system that is used to recover the copper sulfate crystals generated at step 2d during the electroless process.

Storage: The spent filters are stored in drums at the Hazardous Waste Container Storage Area, SWMU2.

Disposal: The spent filters are sent to Rolling Environmentals, Louisiana for incineration.

4. Spent Carbon Activated Filters, D008 Waste

Generation: The spent carbon Activated filters are generated from the close-loop Carbon Treatment unit used in step 2g to polish the tin (Sn) and lead (Pb) solution prior to be poured into the electroplating metal baths.

Storage: The spent filters are stored in drums at the Hazardous Waste Container Storage Area, SWMU2.

Disposal: The spent filters are sent to Rolling Environmentals, Louisiana for incineration.

5. Spent Sn-Pb Regeneration System Filters, D008/D002 Waste

Generation: The spent D008/D002 filters are generated from a serie of filters system located inside the Electroplating Room for the regeneration of tin and lead solutions used in step 2g.

Storage: The spent filters are collected in drums and placed first in a Satellite Area inside the Electroplating Room, SWMU3. Then the drums are transferred and stored at the Hazardous Waste Container Storage Area, SWMU2.

Disposal: The spent filters are sent to Rolling Environmentals, Louisiana for incineration.

6. Circuit Boards Scrap

Generation: It is generated at step 2g after the electroplating of the boards.

Storage: The metal scrap is stored near the Satellite Area inside the Electroplating Room, SWMU3.

Disposal: The metal scrap is sold.

7. Nickel Sulfate in Sulphuric Acid Media (Plating Bath, D002 Waste

Generation: It is generated from maintenance of the nickel bath used during step 2h for microplating.

Storage: The D002 waste is stored in drums at the Hazardous Waste Container Storage Area, SWMU2.

Disposal: The waste is sent to Safety Kleen Envirosystems (PRD090399718) for disposal.

8. Spent 1,1,1-Trichloroethane, F001 Waste

Generation: It is generated at step 2i during the Dry-Film Solder Mask process, specifically from a close-loop bath used for cleaning purposes.

Storage: The F001 waste is stored in drums at the Hazardous Waste Container Storage Area, SWMU2.

Disposal: The spent solvent is sent to Safety Kleen Envirosystems (PRD090399718) for disposal.

9. Spent Acetone, F003 Waste

Generation: It is generated at step 2i during the Solder Mask process, specifically from the cleaning of the boards.

Storage: The F003 waste is stored in drums at the Hazardous Waste Container Storage Area, SWMU2.

Disposal: The spent solvent is sent to Safety Kleen Envirosystems (PRD090399718) for disposal.

10. Spent Methylene Chloride, F001 Waste

Generation: It is generated at step 4 during the degreasing process of the SMT procedure.

Storage: The spent methylene chloride is stored in drums at the Hazardous Waste Container Storage Area, SWMU2.

Disposal: The spent solvent is sent to Safety Kleen Envirosystems (PRD090399718) for disposal.

11. Kimwipes Impregnated with a Lead/Tin Solder Paste, D008 Waste

Generation: It is generated at step 4 during the SMT process.

Storage: The kimwipes are collected in drums placed first in a Satellite Area at the Surface Mount Technology Area, SWMU4. Then, the drums are transferred and stored at the Hazardous Waste Container Storage Area, SWMU2.

Disposal: The kimwipes are sent to Rollings Environmental, Louisiana for incineration.

12. Waste Flux, D001 Waste

Generation: It is generated at step 3 from the wave Soldering Machine.

Storage: The waste Flux is collected in drums and placed first in a Satellite Area at the Wave Solder Area, SWMU5. Then, the drums are transferred and stored at the Ignitable Wastes Container Storage Area, SWMU7.

Disposal: The waste flux is sent to Safety Kleen Envirosystems (PRD090399718) for disposal.

13. Waste Oil Contaminated with Lead, D008/D001 Waste

Generation: It is generated at step 3 during the Wave Solder Module Manufacturing.

Storage: The waste oil is collected in drums and placed first in a Satellite Area at the Wave Solder Area, SWMU5. Then, the drums are transferred and stored at the Ignitable Wastes Container Storage Area, SWMU7.

Disposal: The waste oil is sent to Safety Kleen Envirosystems (PRD090399718) for disposal.

14. Waste Oil and Waste Flux, D001 Waste

Generation: The waste flux is generated from a flux bath located at the Hot Lever Solder Room where the Solder Mask process (step 2i) is performed. The waste oil is generated from an AC Compressor or from processes lines.

Storage: The waste oil and the waste flux are collected in drums and/or safety cans, and placed in a Satellite Area at the Wastewater Treatment Plant, SWMU6. Then, the containers are transferred and stored at the Ignitable Wastes Container Storage Area, SWMU7.

15. Metallic Hydroxide Electroplating Sludge, F006 Waste

Generation: It is generated from the metal precipitation of the WWTP's influents.

Treatment: The WWTP (SWMU8) is a secondary treatment plant. The precipitated metals from the clarifiers are combined into a holding tank which feed a filter press generating the metallic sludge cakes.

Storage: The metallic sludge cakes are collected from the filter press at the WWTP in marino bags. The bags are transferred and stored at the Hazardous Waste Container Storage Area, SWMU2.

Disposal: The F006 waste is sent to the World Resource Company at Phoenix, Arizona or Pennsylvania for metal reclammation.

In summary, the following hazardous wastes are currently generated by the company:

D002 waste, Ammoniacal Copper Bearing Solution
D002 waste, Cooper Sulfate Spent Filters
D003 waste, Spent Carbon Activated filters
D008/D002 waste, Spent Tin-Lead Regeneration System Filters
D002 waste, Nickel Sulfate in Sulfuric Acid media (plating bath)
F001 waste, Spent 1,1,1-trichloroethane
F003 waste, Spent Acetone
F001 waste, Spent Methylene Chloride
D008 waste, Kimwipes impregnated with a Lead/Tin solder paste
D001 waste, Waste Flux
D008/D001 waste, Waste Oil contaminated with Lead
D001 waste, Waste Oil
F006 waste, Metallic Hydroxide Electroplating Sludge

Eight (8) Solid Waste Management Units (SWMUs) have been identified. These are:

SWMU1	two (2) tanks that feed the Mecer Unit (i.e., the Etchant recovery system)
SWMU2	Hazardous Waste Container Storage Area
SWMU3	Satellite Area inside the Electroplating Room
SWMU4	Satellite Area at the Surface Mount Technology Area
SWMU5	Satellite Area at the Wave Solder Area
SWMU6	Satellite Area at the Wastewater Treatment Plant
SWMU7	Ignitable Wastes Container Storage Area
SWMU8	Wastewater Treatment Plant

Refer to Exhibit No. 24 for a computer list of the Hazardous Waste Manifests. Note the quantities of hazardous wastes that had been disposed.

Air Emissions

The following air emissions sources are permitted to be operated at Digital, San Germán (refer to the manufacturing description on Part C of this report).

Source	Emission	Control Equipment
1. Step 1h	Sulfuric Acid, Sulfuric Peroxide, and Sodium Hydroxide	Scrubber, 95% eff.
2. Step 1f	Ammonium Hydroxide, Hydrochloric Acid, and Ammonium Chloride	Scrubber, 96% eff.
3. Step 2b	Potassium Permanganate, Sodium Hydroxide, and Sulfuric Acid	Scrubber, 96% eff.
4. Step 2d	Benzonitrile, Formaldehyde	Scrubber, 92% eff.
5. Step 2d	Hydrogen Peroxide, Sulfuric Acid	Scrubber, 94% eff.
6. Waste Treatment	Sodium Hydroxide, Muriatic Acid, Sulfuric Acid, and Sodium Hydrosulfite	Scrubber, 93% eff.

7. Step 1g	Butyl Cellosolve, and Ammonium Hydroxide	Scrubber, 95% eff.
8. Wet Shop Etcher	Ammonium Hydroxide, and Hydrochloric Acid	Scrubber, 98% eff.
9. Process Room	Sulfuric Acid, and Nitric Acid	Scrubber, 99% eff.
10. Wet Shop Stripper	Butyl Cellosolve, and Ammonium Hydroxide	Scrubber, 98% eff.
11. Dry Film	Acetone	Fan
12. Step 3	Lead	Smog Hog, 99% eff.
13. Step 2g	Sulfuric Acid, Hydrogen Peroxide, Cooper Sulfate	Scrubber, 96% eff.
14. Step 2g	Nitric Acid, Fluoboric Acid	Scrubber, 95% eff.
15. Wet Lab	Sulfuric Acid, Nitric Acid	Scrubber, 99% eff.
16. Step 2i	Butyl Cellosolve, and 1,1,1-Trichloroethane	Fan
17. Hybrid Area	Methylene Chloride, and 1,1,1-Trichloroethane	Fan
18. Boilers (3)		Chimney
19. Emergency Energy Generator (D-399)		
20. Emergency Energy Generator (D-3512)		
21. Emergency Energy Generator (2)		

22. Chemical Line Area	Nitric Acid, Sodium Hydroxide, Sulfuric Acid, Hydrogen Peroxide, Ammonium Hydroxide, Ammonium Chloride	Scrubber, 500 CFM, 99% eff.
23. Inner Layer New Etcher	Ammonium Hydroxide, Ammonium Chloride	Scrubber, 1,500 CFM, 99% eff.
24. Inner Layer New Etcher	Monoethanolamine	Scrubber, 400 CFM, 99% eff.
25. Solder Strip and Microetch	Sulfuric Acid, and Hydrogen Peroxide	Scrubber, 3,000 CFM, 99% eff.
26. Pre-Clean and Post Clean Module	Hydrogen Peroxide, Sulfuric Acid, and Sodium Hydroxide	Scrubber, 3,000 CFM, 99% eff.
27. Emergency Energy Generator		
28. Hot Solder Leveling		Smog Hog, 99% eff.
29. Emergency Generator		
30. Sludge Dryer		Chimney

The operating permits, PFE-64-0485-0348-I-II-(0), and PFE-LC-RM-64-0190-0046-I-II-0 are presented on Exhibits No. 22 and 23, respectively.

III. Environmental Setting

A. Surrounding Land Use

The immediate vicinity of the site is a mixed industrial, commercial, and residential area. There is a rural land north of the facility and the Puerto Rico Energy Power Authority (PREPA) northwest. The IOLab Company is south of the facility, and the urban center of San Germán, which has a population of approximately 13,100. is 2,000 feet south of the site.

There are a road and a residential area, El Convento, west of the site. The municipality of San Germán, which is located near the southwest corner of Puerto Rico and has a total population of approximately 32,900, covers most of the 3-mile vicinity around the site. A rural land plot owned by Mr. Sambolín is east to the facility.

The facility is located outside the 100-year flood zone.

B. Meteorology

As per reference No. 2, the climate in the Mucara series is humid. Rainfall ranges from 65 to 90-inches, and the annual temperature ranges from 72° to 79°F.

The rainfall generally is heaviest during May and the period August through October and lightest in the period January through March. Sunshine is abundant even during the so-called rainy seasons.

The wind regime is typical of that found on the west coast of an island on which the climate is generally under the influence of prevailing easterly trade winds but that is also affected by land and sea breezes. The sea breeze along the western coast must overcome the prevailing easterly winds, and sometimes it is early in the afternoon before this occurs. It sets in later along the west coast than along the north coast. There is much variation in both direction and speed of the wind caused by local topography, especially in the mountainous interior. In general the strongest winds occur early in the afternoon, and the lighted during the night. Windspeed also varies seasonally. Usually the wind is strongest in July and is light in autumn. The average hourly speed and direction are remarkably constant.

Variations in relative humidity are rather large during a 24-hour period. The relative humidity ranges from a percentage in the low 90's at night to a percentage in the low 60's during the day. Humidity is generally highest during the night when the temperatures are lowest, but it begins to fall as the temperature begins to rise. It is lowest about the time that the temperature is highest. The fairly high relative humidity, combined with high temperature, would usually result in physical discomfort, but several factors that greatly affect personal comfort make this combination normally quite pleasant in the area. Among the factors that are most beneficial in lowering the sensible temperature are the constant wind and the cool sea breeze that blows in the afternoon when temperatures are highest.

Generally, the pattern of cloudiness is about the same as that in other parts of the island. Cloudiness is minimum during the night and is maximum, amounting to 0.6 to 0.8 of the shy, during the late forenoon and in the afternoon. Average daily cloudiness is lowest in March and reaches one peak late in spring and another peak in September and October.

Hurricanes and tropical storms are important factors of climate in the Mayagüez Area, but the frequency of hurricane is small. In general the hurricane season in the North Atlantic lasts from June through November, but in Puerto Rico the season is principally from August through the first part of October. Such storms generally approach from the east or southeast.

C. Surface Hydrology

Information about the surface water route is obtained from Reference No. 3.

The facility slope is estimated to be less than 2 percent to the west-northwest. The intervening terrain slope between the site and the nearest downslope surface water, The Río Guanajibo, is also estimated to be less than 2 percent to the west-northwest. Storm water runoff is caught by storm drains along Routes 362 and 360. There is a storm water out fall on the west side of Route 360. The overland runoff route from the outfall to the river is approximately 1,000 feet long on the river's flood plain. The total distance from the site to the river is approximately 2,000 feet. The exact uses of the Río Guanajibo are indeterminate, although it is probably used for irrigation somewhere along its course. Surface water is used as potable supply for a large percentage of the population of San Germán, but the PRASA intakes for municipal supply are located north and upstream of the DEC facility; on the Cain and Hocomuco Rivers. There are some non-PRASA surface water intakes in the area, but they also are not located downstream of the site. There are no known drinking water intakes within 3 miles downstreams of the site. There are no sensitive environments within 2 miles of the site. the 1-year 24-hour rainfall in the area is 18 inches.

There are little potential for surface water contamination. Currently, all hazardous wastes are properly contained on site. There are other industrial facilities immediately adjacent to the site from which storm water runoff also enters the storm drains along Routes 362 and 360. No surface water intakes exist within 3 miles downstream of the site.

D. <u>Geology and Soils</u>

From Reference No. 4, the following information about the site soils is obtained. The information is based upon a study made in the immediate vicinity of DEC's board shop at the Printed Circuit Facility.

From ground surface to depths of approximately 8 feet to 16 feet is a fill. This material varies from a silty sand with more than 20 percent slightly plastic fines. Additionally, although not observed in the test borings, it is understood that a gravel fill of processed stone underlies portions of the parking areas and the building.

Immediately underlying the fill is a discontinuous layer of organic soil. This deposit varied in thickness, where encountered, from less than 0.5 feet thick at test boring OW-108 to more than 2.5 feet thick at test boring OW-106. These deposits are believed to be the topsoil at ground surface prior to site development.

The organic deposits (or fill where the organics are not present) are in-turn, underlain by natural deposits of stiff to very stiff, slightly plastic silt with up to about 35 percent sand and gravel size material. While not fully penetrated by all explorations, this deposit is believed to be typically 30 feet thick and is directly underlain by bedrock.

Detailed descriptions of the soils encountered at the test borings are provided on the boring logs presented on Exhibit No. 25. For a pictorial description of these general soil conditions, refer to Exhibit No. 26.

E. Hydrogeology

The information about the groundwater route is obtained from Reference No. 3.

There are two groundwater flow regimes beneath the DEC facility. From the ground surface to depths of 8 to 16 feet, there is a highly permeable fill ranging from silty sand to sandy gravel. Underlying the fill is a discontinuous layer of organic soil, believed to be topsoil at ground surface prior to development of the site. The organic soil varies in thickness from 0 to 2.5 feet. The organic soil (or fill where organic soil is not present) is underlain by approximately 30 feet of stiff silt with up to 35 percent sand and gravel. The silt has a permeability between 10-5 and 10-7 cm/sec. The silt is underlain by bedrock. Perched groundwater flow in the overburden is toward the west in the vicinity of the site. There is also some vertical flow of groundwater down into bedrock, which is an impermeable formation consisting of volcanic tuffaceous breccia and conglomerate and cemented limestone. The top of the bedrock is approximately 40 feet below ground surface. Groundwater flow occurs in fracture and joint zones within the bedrock.

There are five PRASA groundwater wells, which draw water from bedrock, within 1 mile of the site. Locations of the wells are shown on the Three-Mile Vicinity Map on Exhibit No. 27. Only the Real well, located 0.7 mile northwest of the DEC facility, is actively used. Groundwater is used to supply drinking water to approximately 5,000 people in San Germán.

There are eleven shallow observation wells, a shallow collection well, and six deep production wells at the DEC facility. The collection well is 15 feet deep, and the observation wells are all between 7 and 38 feet deep. They are all screened in the overburden. Deep well W-5 is cased to 57 feet deep (10 feet below top of bedrock) and is 350 feet deep. Well W-6 is cased to 80 feet deep (45 feet below top of bedrock) and is 407 feet deep. Well W-6 is cased to 80 feet deep (45 feet below top of bedrock) and is 407 feet deep. The exact depths of the other DEC deep wells are unknown. The collection well was installed in 1983 to contain the wastewater spill, and the observation wells and two deep wells were installed to monitor its effectiveness. Well locations are shown on Exhibit No. 28. The analytical data and reference No. 4 indicate that the collection well was effective in containing the wastewater spill. The collection well remains in place to contain spills or leakage from facility operations. It is sampled on a weekly basis.

The net annual precipitation in the area is approximately 14 inches.

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IV. Summary of Visual Site Inspection

As part of the RCRA Facility Assessment (RFA) performed to Digital Equipment Corp., San Germán, a preliminary visit and a visual site-inspection were conducted by EQB personnel on August 2, 1989 and February 20, 1990, respectively.

The following EQB personnel met with Mr. Angel Serrano of Digital, San Germán:

Date	Personnel
August 2, 1989	Yamira L. Rivera Rivera Aida T. Fuentes Rivera
February 20, 1990	Néstor M. Rivera Guzmán Aida T. Fuentes Rivera

During the Preliminary Visit, the purposes and scope of the RFA process were explained to the facility representatives. The manufacturing processes were explained to the EQB personnel and the process areas were visited.

During the Visual Site Inspection (VSI) performed on February 20, 1990 a meeting was held among EQB personnel, Mr. Angel Serrano from Digital, Alberto Ramos and José J. Rivera from Pedro Panzardi and Associates in order to discuss the Notice of Deficiencies (NOD) of the Closure Plan submitted by Digital. The Remedial Action at the Underground Tanks Area was also discussed with Mr. Serrano and Mr. Américo Abadía. Information about the facility was completed and company's files revised, some process areas were re-visited and photos from the Solid Waste Management Units (SWMUs) and Areas of Concern (AOC) were obtained.

The company's file revised during the VSI included the following: the Inspection Logbook of the Hazardous Waste Storage Area, the Hazardous Waste Storage Area Daily Log Sheet, Removal from Storage Record, the Wastewater Treatment Logbook, and the Analysis Report of Groundwater wells.

The Wastewater Treatment Logbook revealed the following:

1) On January 30, 1990 Three (3) reactors at the Complex Treatment System overflow because the Flocculation system was obstructed.

2) On February 7, 1990 The Flocculation system was obstructed at the Non-Complex Treatment System. The sludge overflowed the grills. The sludge blowdown pump was turned on manually.

3) On February 8, 1990 The sludge overflowed the grills at the Developer/Stripper Treatment System. The sludge blowdown pump was turned on manually.

4) On February 15, 1990 Overflow of tank #110 at the Batch Treatment System.

The complete RFA's Inspection Report is presented on Appendix A. Following are the photographs obtained during the VSI performed on February 20, 1990.

V. Solid Waste Management Units

A. SWMU-1

Unit Number: SWMU-1

Unit Name: Two Storage Tanks that feed the Mecer Unit (The spent Etchant solution recovery system).

Unit Location: The two storage tanks and the Mecer Unit are located towards the northeast of the facility between the 250,000 gallon Water Storage Tank and the Diesel Storage Tanks areas. Refer to Exhibit No. 29 for a facility plot plan.

Unit Description: The two storage tanks are made of reinforced fiberglass and have a capacity of 6,000 gallons each. (Refer to Photos No. 11 and 13 on the part IV of this report). One tank receives the spent etchant from the etcher process and the other one receives the rinsewaters. The spent etchant solution which is ammonium chloride contaminated with copper enters the Mecer Unit through a trenches system. The trenches are a combination of an epoxy liner and fiberglass (Celcrete HW-200, maximum thickness). The Mecer Unit is a waste minimization electrolitic unit which consists of two systems: an organic media separation unit, and an electroplating unit. The spent etchant (blue color solution) enters the separation unit where the copper is released from the etchant solution by organic extraction. The released copper is sent to the electroplating unit. It is plated by electrowining cells and comes out as a copper solid plate. The fresh etchant solution is stored in a 9,000 gallon tank which has an own secondary containment system located in front of the Diesel Storage Tank Area (refer to Photo No. 15, Part IV of this report). The

Mecer Unit has a control panel which discharges the fresh etchant through selenoid valves to the 9,000 gallon tank. The fresh etchant goes through trenches to the tank. The trench system is monthly inspectd and every three months the trenches are vacummed truck if necessary. If the Mecer Unit is down, a tank truck is placed beside the unit to collect the waste from the Spent Etchant Tank and sent the spent etchant solution to CP Chemical, South Carolina for copper reclammation.

The Mecer Unit has an emergency pump which is activated in case that an overflow of the spent solution enters the unit. The emergency pump acts as a spill control device. It was installed in 1988 after a spill event.

Release Control: The two storage tanks are surrounded by a concrete dike with an epoxy liner and a capacity to hold 15,000 gallons.

Date Operations Started: Undetermined

Current Status: Active

Waste Managed: Ammoniacal Copper Bearing Solution, D002 waste.

Environmental Setting: Any spill occuring within the tank area will be contained inside the concrete dike, therefore, the probability that the waste reach the soils/groundwater is considered to be low.

However, when it is necessary to collect the waste into a tank truck, the probability that any spill reach the concrete/soil increases because there is no secondary containment system at the area used for loading of the waste into the tank truck.

Historical Evidence of Release:

On Thursday, October 27, 1988, at about 12:30 pm, near 15 gallons of used etcher solution spillage on the sum-pit from the Mecer extraction area, resulting from a siphon process from the used etchant tank through the pump to the extraction unit and then overflowed to the mentioned sump-pit. Part of the solution overflowed from the pit to the trench system and then to the emergency pit. Actions taken during the spill and measures taken to prevent further occurrence are presented in the report on Exhibits No. 16.

Conclusions and Further Actions:

The company has taken appropriate measures to prevent further occurrence of spills at the Mecer Unit. Also, any spill occurring at the storage tanks area will be contained in its secondary containment system. However, when the Mecer Unit is down, a tank truck is placed beside the unit to collect the waste from the Spent Etchant Tank and sent the spent etchant solution to CP Chemical, South Carolina for copper reclammation. Since there is no spill control system at the area where the tank truck is placed, the probability that any spill occurring during the loading of the waste reach the concrete/soil of the facility is considered to be high. Therefore, we recommend that the company adds an appropriate release control where the tank truck is placed for waste collection.

B. SWMU-2

Unit Number: SWMU-2

Unit Name: Hazardous Waste Container Storage Area. (HWCSA).

Unit Location: It is located towards the Northwest of the facility. Refer to Exhibit No. 29 for a facility plot plan.

Unit Description: The Hazardous Waste Container Storage Area consists of a three compartment continuously locked area surrounded by a cyclone fence with cyclone gate and roof (refer to Photo No. 1, Part IV of this report and to Exhibit No. 30 for a drawing). From the left, the first compartment is used to store corrosives D002 wastes and spent solvents; the second compartment is used to store the electroplating sludge bags; and the third compartment (to the right backside) is currently used for storage of raw material because it was previously found by EQB that the waste Flux (D001 waste) and the D008/D001 waste could not be stored in it since the third compartment does not comply with the 50-feet from property line requirements. The third compartment had a maximum inventory of eight (8) fifty-five (55) gallon drums. The SWMU2 is equipped with a telephone, a safety eyewash and a safety shower. At the southwest side of the unit, there is an automatic finger for management of Hazardous Waste drums.

Release Control: The two active compartment are surrounded by a concrete dike. The first compartment (for drums storage) has a 72 gallons pit for spillage and is surrounded by a 22 inches dike. A 5 inches height ramp at the entrance prevent the filtration of rainwater to the area. The dike around the area added to the sump capacity will accumulate a total of 2,106 gallons of liquid before any liquid is spilled outside through the entrance ramp.

The second compartment (for sludge bags storage) has a 180 gallons capacity sump, a 22 inches dike and a 5 inches height entrance ramp. The sump and dike around the area will collect a total of 3,043 gallons of material.

The third compartment has a concrete dike with a capacity to hold 600 gallons.

SWMU2 is equipped with a kit for the control of minor spills, sump pumps, and a neutralization system.

Date Operations Started: The unit is active since 1973, but at that time, there was no segregation of ignitable wastes from the others hazardous wastes. Also, from 1973 to 1983, the F006 sludge was not stored at the HWCSA but in two storage tanks located at the Wastewater Treatment Plant.

The unit has its three-compartment structure since 1983 after two reconstructions of the original storage area were performed in 1981 and 1983.

In 1987, the third compartment of the unit started to be used for storage of raw materials.

Current Status: A Closure Plan was submitted for the unit (two-compartments) on November 16, 1988. The first revised Closure Plan was then submitted on October 9, 1989 from which a Review Notice of Deficiencies (NOD) response has been issued on October 8, 1990.

The unit (two-compartments) is active but a New Hazardous Waste Container Storage Area has been habilitated by the company to start the storage of hazardous wastes for less than ninety days period.

Wastes Managed: Cooper Sulfate Spent Filters, D002 waste; Spent Carbon Activated filters, D008 waste; Spent Sn-Pb Regeneration System Filters, D008/D002 waste; Nickel Sulfate in Sulfuric Acid media (plating bath), D002 waste; Spent 1,1,1-trichloroethane, F001 waste; Spent Acetone, F003 waste; Spent Methylene Chloride, F001 waste; Kimwipes impregnated with a Lead/Tin solder paste, D008 waste; Metallic Hydroxide Electroplating Sludge, F006 waste.

Environmental Setting: There is a potential for concrete/soil contamination throughout the hazardous wastes drums management pathway, i.e., from the automatic finger to the entrance ramp of the unit's first compartment.

However, the probability that any spill reach the soils beneath the unit is considered to be low due to the adequacy of the secondary containment system.

Historical Evidence of Release: None reported but referred to the Regulatory History (Part II B of this report), dates: September 16, 1981; March 16, 1982; May 11, 1982; May 6, 1986; March 16, 1987; June 30, 1987; May 25, 1988.

Conclusions and Further Actions: The first revision of the Closure Plan, dated October 9, 1989 does not include the third compartment of the HWCSA. Prior to 1987, the third-compartment of the HWCSA was used to store Flux (D001 waste) and the D008/D001 waste. After an EQB inspection performed on June 30, 1987, it is determined that the company is in violation to rule 812 B/ 40 CFR 265.176 (storage of ignitables wastes 50 feet away from property line). The company habilitated another area for storage of ignitable wastes and started to use the third-compartment of the HWCSA for storage of raw material.

Due to the fact, that hazardous wastes were formerly stored at the third compartment, it should be included in the Closure Plan of the unit.

Also, the company should consider, as part of the Closure Plan, to collect concrete samples along the hazardous waste drums management pathway, i.e., from the automatic finger to the entrance ramp of the unit's first compartment.

C. **SWMU3**

Unit Number:	SWMU3
Unit Name:	Satellite Area inside the Electroplating Room
Unit Location:	SWMU3 is located in the left corner at the back of the Electroplating room.
Unit Description:	It consists of a segregated area inside the electroplating area for accumulation of drums. The drums are placed over a wood pallet. A total of 4 fifty five gallon drums can be placed on the wood pallet. The area is identified with a warning sign. Refer to photos 23 and 25, Part IV of this report.
Release Control:	There is no secondary containment system, but, the drums are placed over a 4' x 4' wood pallet.
Date Operations Started:	January 1990
Current Status:	Active
Wastes Managed:	Spent Sn-Pb Regeneration System Filters, D008/D002 waste.
Environmental Setting:	Any leakage or spill from the drums will reach the concrete floor inside the Electroplating room but it is unlikely that a spill reach the soil beneath the Electroplating room.
Historical Evidence of Release:	No evidence of release has been reported. However, during the VSI performed on February 20, 1990 there were four fifty-five gallon drums being filled at the satellite area.

Conclusions and Further Actions:

Accumulation of hazardous wastes at satellite area is limited to fifty-five gallons of hazardous wastes. The company is responsible for compliance with the requirements stated on 40 CFR 262.34 (c) at all times.

A memo will be sent to the Inspection, Monitoring and Surveillance Section of the EQB's Hazardous Waste Division recommending that the unit should be inspected in a Full RCRA TSD facility inspection for compliance with the RCRA requirements.

D. SWMU4

Unit Number:	SWMU4
Unit Name:	Satellite Area at the Surface Mount Technology Area
Unit Location:	The unit is located inside the Module Assembly room, specifically at the Surface Mount area.
Unit Description:	The unit consists of a segregated area at the Surface Mount Area for accumulation of wastes into a single fifty-five (55) gallon drum. The segregated area is marked with a yellow/black adhesive tape in a square form. The drum is identified with a hazardous waste label. The drum is placed directly on the floor.
Release Control:	None
Date Operations Started:	January 1990
Current Status:	Active
Waste Managed:	Kimwipes impregnated with a Lead/Tin solder paste, D008 waste.
Environmental Setting:	Any spill from the drum will reach the floor inside the Module Assembly room, but it is unlikely that a spill reach the soil beneath the room.
Historical Evidence of Release:	None reported.
Conclusions and Further Actions:	The Satellite Area at the Surface Mount Technology Area is considered to be adequate. It should be pointed out though that the company is responsible for compliance with the requirements stated on 40 CFR 262.34 (c) at all times.

A memo will be sent to the Inspection, Monitoring and Surveillance Section of the EQB's Hazardous Waste Division recommending that the unit should be inspected in a Full RCRA TSD facility inspection for compliance with the RCRA requirements.

E. <u>SWMU5</u>

Unit Number:	SWMU5
Unit Name:	<u>Satellite Area at the Wave Solder Area</u>
Unit Location:	The unit is located inside the Module Assembly room, specifically at the Wave Solder Area.
Unit Description:	It consists of an OSHA approved safety cabinet with a maximum inventory of two (2) fifty-five (55) gallon drums. A fifty-five gallon drum is placed inside the cabinet for accumulation of wastes. The safety cabinet and the drum are both identified with hazardous waste labels. The cabinet is grounded.
Release Control:	None
Date Operations Started:	January 1990
Current Status:	Active
Waste Managed:	Waste Flux, D001 waste; Waste oil contaminated with lead, D008/D001 waste.
Environmental Setting:	Any spill from the drum will reach the cabinet floor, but it is unlikely that a spill reach the soil beneath the room.
Historical Evidence of Release:	None reported.
Conclusions and Further Action:	The Satellite Area at the Wave Solder Area is considered to be adequate. It should be pointed out though that the company is responsible for compliance with the requirements stated on 40 CFR 262.34 (c) at all times. A memo will be sent to the Inspection, Monitoring and Surveillance Section of the EQB's Hazardous Waste Division recommending that the unit should be inspected in a Full RCRA TSD facility inspection for compliance with the RCRA requirements.

F. SWMU6

Unit Number:	SWMU6
Unit Name:	Satellite Area at the Wastewater Treatment Plant
Unit Location:	The unit is located at the Wastewater Treatment Plant
Unit Description:	It consists of a safety cabinet where two fifty-five gallon drums are placed inside the cabinet for accumulation of wastes. The drums are identified with hazardous wastes labels. Refer to Photo No. 33, Part IV of this report.
Release Control:	None
Date Operations Started:	January, 1990
Current Status:	Active
Wastes Managed:	Waste Oil and Waste Flux, D001 wastes
Environmental Setting:	Any spill from the drum will reach the cabinet floor, but it is unlikely that a spill reach the soil beneath the plant.
Historical Evidence of Release:	At the time of the VSI performed on February 20, 1990, there were two fifty-five gallon drums, one of them containing Flux waste and the other one containing waste oil. There were also four safety cans containing Waste Flammable from processes lines and others containing Freon and Methylene Chloride. The waste flux is generated from a flux bath located at the Hot Lever Solder Room where the Solder Mask process is performed.
Conclusions and Further Actions:	The Satellite Area at the Wastewater Treatment Plant does not comply with the requirement on 40 CFR 262.34 (c)(1) which states that the area should be at or near any point of generation under the control of the operator.

The satellite area at the Wastewater Treatment Plant is considered to be in non-compliance. The company is responsible for compliance with the requirements stated on 40 CFR 262.34(c) at all times.

A memo will be sent to the Inspection, Monitoring and Surveillance Section of the EQB's Hazardous Waste Division recommending that the unit should be inspected in a Full RCRA TSD facility inspection for compliance with the RCRA requirements.

G. SWMU7

Unit Number:	SWMU7
Unit Name:	Ignitable Waste Container Storage Area
Unit Location:	It is located to the northwest of the facility at the middle west side of Building No. 2.
Unit Description:	The unit consists of a 5' x 10' structure one-fenced side, two-wood sides, and one-concrete side. The structure has a zinc-roof. The area is grounded. It has two signs: one reads Flammables and the other one reads Residuum Chemicals Storage. The unit is watched 24 hours with camera. One side of the storage area is 60 feet away from property boundary and the other three. Sides of the area are 86 feet away from property boundary. Refer to Photo No. 3, Part IV of this report.
Release Control:	Its containment system consists of a six inches-concrete dike. The drums are placed over wood pallets. Any spill is collected with pumps and absorbent material.
Date Operations Started:	1987
Current Status:	Active; but the area will be included in the Closure Plan of the HWCSA.
Wastes Managed:	Waste Flux, D001 waste; Waste oil contaminated with Lead, D008/D001 waste; Waste Oil, D001 waste.
Environmental Setting:	The probability that any spill reachs the soil beneath the unit is considered to be low because spill management practices seems to be appropriate.
Historical Evidente of Release:	None reported

Conclusions and Further Actions:

The revised Notice of Deficiencies response issued by EQB on October 8, 1990 informs the company that the Ignitable Wastes Container Storage Area should be included in the Closure Plan submitted for the HWCSA.

As part of the closure, the unit should be decontaminated, sampled and analyzed to demonstrate sucess of decontamination. No further action is required at this time.

F. SWMU8

Unit Number: SWMU8

Unit Name: Wastewater Treatment Plant (WWTP)

Unit Location: It is located towards the northeast side of the facility at the east side of Building No. 2. See location plan for Exhibit No. 29.

Unit Description: In general, the process waste treatment plant receives wastewaters which contain metallic ions (approximately 200,000 gallons/day). The metallic ions are removed from the wastewaters by precipitation of pH adjustment, and then settled in a sedimentation tank where the sludge settles to the bottom of the tank. The process waste treatment plant generates the metallic sludge which is listed as a hazardous waste F006 and the treated wastewaters from the plant are discharged to the municipal sewerage system at San Germán operated by PRASA. Laboratory tests for the control of the metallic ions escaping treatment is done daily at the WWTP laboratory. As well, samples are sent to private laboratories for analysis on a weekly basis.

The sludge pass to a holding tank (TK 23) and then to a filter press for dewatering, resulting in a cake. The filter press cake is shipped to continental U.S. for metal recovery or final disposal in an approved hazardous waste site. An approximate quantity of ten (10) tons of sludge are weekly generated.

TK 23 is an on-ground open tank made of reinforced fiberglass with an approximate capacity of 4,000 gallons (refer to Photo No. 31, Part IV of this report).

The influents to the WWTP are segregated into three different streams in order to be treated separately. The streams are: the complexed alkaline rinse stream, the non-complex acid rinse stream, and the developer/stripper (PCF's organic chemicals) rinse stream. Each stream is treated as follows:

1. Complexed alkaline rinse streams - The decant filtrate and complexed rinse streams enter the complexed rinse collection tank 105 T1 through a basket strainer. The level in the tank is sensed by level switches LS1-LS4. These levels switches control the operation of the complexed process pumps, 102 PW1 and 102 PW2. In the event that these pumps fail to keep up with the incoming stream, and audible/ visual alarm will be enabled.

The complexed process pumps transfer the collected waste rinses from tank 105 T1 to reaction tank 105 T2. The function of this tank is to break the chelating characteristics of the rinse stream. This is accomplished by mixing and adjusting the pH with sulfuric acid and feeding phosphoric acid and sodium hydrosulfite. The pH is controlled by the Leeds & Northrup pH meter and its corresponding LMI pump for sulfuric acid. The LMI pumps for sodium hydrosulfite and phosphoric acid are interfaced with the transfer pump system for tank 105 T1.

The waste stream then flows by gravity to reaction tank 105 T3. The function of this tank is first stage pH neutralization. This is accomplished by mixing and feeding lime to elevate the pH. The pH is controlled by a Leeds & Northrup pH meter and probe.

The waste stream then flows by gravity to reaction tank 105 T4. The function of this tank is second stage pH neutralization. This tank is equipped and operated similar to 105 T3.

The stream then flows by gravity to 105 T5. The function of this tank is flash mix/flocculation. The metal precipitate that has been formed by the previous operations is allowed to grow in size and weight by adding polymer in the flash mix area to enhance the settling rate. The polymerized stream is then gently mixed in the flocculation section to promote large floc particle growth.

After flocculation in 105 T5, the waste stream enters the clarifier 105 T6. The function of this tank is to accomplish liquid/solid separation. The solids settle into the bottom core and the liquid rises through the plate packs and into the effluent launder. The solids are automatically removed by a sludge pump that is activated by a timer in the control panel. A sludge recirculation pump is also provided to assist floc formation by adding small amounts of settled solids to the flocculation section.

The waste stream then flows by gravity to tank 105 T7, which is the water collection tank. The function of this tank is to act as source reservoir for the polishing filter pumps. The polishing filter pumps and alarm system are activated by level switches LS5-LS7, which are located in tank 105 T7.

The polishing filter pumps transfer the treated water through the penfield filters 105 F1A and 105 F1B to the final pH adjustment tank 102 T7.

The final pH adjustment tank 102 T7 serves two functions. One function is to adjust the pH of the treated water to meet local discharge regulations. The second function is to provide a reservoir of clean water for backwashing the Penfield filters. This tank is equipped with a sulfuric acid feed system which is controlled by a Leeds & Northrup pH meter and probe, for pH adjustment. This tank is also equipped with level switches LC1-LC4, which control the operation of the mixer and recycle pump.

A backwash supply tank 105 T14 (existing T10) is connected to serve as a backwash water reservoir for the Penfield filters. This tank is equipped with level switches LS8-LS10, which control the backwash pump for the Penfield filters. The backwash water is pumped from the backwash supply tank 105 T14 through the Penfield filters and into the backwash holding tank 105 T13. The backwash water is then pumped back to the complexed rinse collection tank 105 T1 for retreatment.

An effluent monitoring tank 102 EMS1 is provided to monitor the flow from the system and provide a sample reservoir for the ISCO sampler. This tank is equipped with a 90 degree V notel weir and a Drexel brook flow sensor.

2. <u>Non-complex acid rinse streams</u> - The non-complex acid rinse stream enters the rinse collection tank 102 T1 through basket strainer. The level in the tank is sensed by level switches LS1-LS4. These level switches control the operation of the non-complex process pumps, 102 PW1 and 102 PW2. In the event that these pumps fail to keep up with the incoming stream, and audible/visual alarm will be enabled.

The non-complex process pumps transfer the collected waste rinses from tank 102 T1 to reaction tank 102 T2. The function of this tank is pH adjustment. This is accomplished by mixing and adjusting the pH with sulfuric acid or lime as required. The pH is monitored by a Leeds & Northrup pH meter, which controls the feed systems for sulfuric acid and lime.

The stream then flows by gravity to reaction tank 102 T3. The tank is flash mix/flocculation. The metal precipitate that has been formed by the previous operations is allowed to grow in size and weight by adding polymer in the flash mix area to enhance the settling rate. The polymerized stream is then gently mixed in the flocculation section to promote large floc particle growth.

After flocculation in 102 T4, the waste stream enters the clarifier 102 T5. The function of this tank is to accomplish liquid/solid separation. The solids settle into the bottom comes and the liquid rises through the plate packs and into the effluent launder. Anti-scale polymer is pumped into the overflow through to prevent scale buildup in subsequent operations. The solids are automatically removed by a sludge pump that is activated by a timer in the control panel. A sludge recirculation pump is also provided to assist floc formation by adding small amounts of settled solids to the flocculation section.

The waste stream then flows by gravity to tank 102 T6, which is the water collection tank. The function of this tank is to act as source reservoir for the polishing filter pumps. The polishing filter pumps and alarm system are activated by level switches LS5-LS7, which are located in tank 102 T6.

The polishing filter pumps transfer the treated water through the Penfield filters 102 F1A and 102 F1B to the final pH adjustment tank 102 T7.

3. Developer/Stripper (PCF's Organic Chemicals) Rinse Streams - The wave solder and surface mount rinse waste streams are pumped by air diaphragm pumps 108 PDI, 108 PD2 and 108 PD3 into the first stage wave solder reaction tank 107 T2. The air diaphragm pumps are manually activated by local disconnects. The function of this tank is to oxidize the organics in this stream which interfere with the subsequent processing steps. This is accomplished by mixing, adjusting the pH with sulfuric acid ($H2S04$) and feeding Potassium Permanganate ($KMN04$). The pH is sensed by a Leeds-Northrup pH meter which controls the sulfuric acid feed. The Oxidation Reduction Potential is sensed by a Leeds-Northrup ORP meter which controls the KMN04 feed.

The waste stream then overflows to 107 T3. The function of this tank is to complete the oxidation step started in 107 T2. This is accomplished by mixing and feeding KMN04 as in 107 T2.

The develop/strip rinses enter the Develop/ Strip rinse Collection Tank 107 T1 through a basket strainer. The level in this tank is sensed by level switches LS1-LS4. These level switches control pumps 107 PW1 and 107 PW2. In the event that these pumps fail to keep up with the incoming stream, an audible/visual alarm will be enabled.

The overflows from 107 T3 and 107 T1 are combined in 107 T4. The function of this tank is to prepare the metals in solution for the next pH neutralization step. The metals are prepared by mixing and adjusting the pH with sulfuric acid, adding phosphoric acid, and adding ferrous sulfate. A Leeds-Northrup pH meter is supplied to control the sulfuric acid feed system. Phosphoric acid and ferrous sulfate feeds are controlled by the level switches in the Develop Strip Rinse Collection Tank.

The waste stream from 107 T4 then overflows to 107 T5. The purpose of this tank is precipitation of the metals from the waste stream. This is accomplished by mixing and adding lime to elevate the pH. A Leeds-Northrup pH meter is supplied to control the lime feed.

The waste stream then overflows to the Flash mix/Flocculation Tank 107 T6. The purpose of this tank is to make the precipitate that was formed in previous tank grow in size to enhance the settling rate. This is accomplished by mixing and adding polymer. The polymer feed is controlled by a level switch in Rinse Collection Tank.

The overflow from 107 T6 enters the clarifier 107 T7. The purpose of this tank is separation of the solids formed in the previous operations. The solids settle into the ones and are automatically pumped to the Sludge Thickening Tank by an air diaphragm pump. A small stream of sludge will be recirculated to the 107 T6 by an air diaphragm pump. The purpose of this side stream is to assist in flocculation at times of low solids concentrations. The clarified water rinses through the plate packs and into the overflow troughs. Anti-scale polymer is pumped into the overflow trough to prevent build up in subsequent operations.

The waste stream then overflows to Water Collection Tank 107 T8. The purpose of this tank is to act as a reservoir for the polishing filter pumps. The polishing filter pumps 107 PW3 and 107 PW4 are controlled by level switches LS5-LS7.

A complete description of the company's WWTP is presented on Exhibit No. 31.

The filter backwash tanks showed on photo no. 27 (part IV of this report) are made of reinforced fiberglass and each one has a capacity of 3,000 gallons.

There are also two Batch Treatment Tanks (TK 24A and TK 24B) used for the concentration and decantation of rinses generated from any spill or maintenance jobs. Each tank is made of reinforced fiberglass and has a capacity of 6,000 gallons.

The rest of the tanks (except also Tk23) are made of reinforced steel with a special coating and has a double-tank system.

Release Control: Besides the different pumps, alarm systems and level switches already explained in the Unit Description Section, the WWTP has an acid-proof concrete floor and a trenches system to collect spills. The spills are sent to the Batch Treatment tanks for treatment.

Date Operations Started: The company has actively operated a WWTP since 1968. The original WWTP consisted of several tanks in series (refer to Exhibit No. 32 for a schematic drawing).

Tk 23 (the sludge holding tank that feeds the filter press), the current filters backwash tanks (on Photo No. 27) and the Batch Treatment tanks are from the original WWTP. TK 23 primary and the current filters backwash tanks as an alternative were used to store the F006 metallic sludge generated from the WWTP prior to out-site disposal.

Since 1983, TK 23 has been used as a sludge holding tank to feed the filter press that was installed at this year (1983).

The original WWTP was modified in 1988 in order to comply with the new Pre-Treatment Regulations of the Puerto Rico Aqueduct and Sewer Authority (PRASA).

Current Status: Active

Wastes Managed: Complexed alkaline rinse streams; non-complex acid rinse streams; developer/stripper (PCF's organic chemicals) rinse streams. An F006 waste (metallic sludge) is generated from the process waste treatment plant.

Environmental Setting: The probability that any spill or overflow reachs the soils/or ground-water beneath the facility is considered to be low because the release controls of the unit (i.e., the pumps, alarm systems, level switches, acid-proof concrete floor, trenches system) are appropriate.

Historical Evidence of Release: During the RFA's inspection performed on February 20, 1990, the Wastewater Treatment Logbook was revised and it revealed the following:

1) On January 30, 1990 - three (3) reactors at the Complex Treatment System overflow because the Flocculation System was obstructed.

2) On February 7, 1990 - the Flocculation system was obstructed at the Non-Complex Treatment System. The sludge overflowed the grills. The sludge blowdown pump was turned on manually.

3) On February 8, 1990 - the sludge overflow the grills at the Developer/Stripper Treatment System. The sludge blowdown pump was turned on manually.

4) On February 15, 1990 - overflow of tank #10 at the Batch Treatment system.

Conclusions and Further Actions:

The original Part A Permit Application (Exhibit No. 5) included the Sludge Holding Tank (TK 23) and the current filters backwash tanks as part of the facility's hazardous waste management processes. However, due to the frequency of the sludge generation the tanks were not apparently used for more than 90 days storage. Refers to Exhibit No. 33 for an EQB inspection report (dated March 20, 1981) it is stated that the sludge is store in TK 23 and collected three times per week.

At present, TK 23 is used to hold the sludge and feed the filter press, and the other tanks are used for filter backwash. Since the tanks are currently part of the WWTP and also the tanks seems to be in good condition no further actions are required at this time.

VI. Areas of Concern

A. AOC1

Unit Number:	AOC-1
Unit Name:	San Germán Municipal Landfill
Unit Location:	Unknown
Unit Description:	The landfill consisted of an open dump which was operating in violation to the state regulations. The open dump was adjacent to a small creek which was being reached by all the solid wastes.
Reason to be Considered an Area of Concern:	From 1968 till 1974, the company used to disposed the digested sludge generated from the process effluents treatment at the San Germán Municipal Landfill. On August 12, 1974, the EQB emitted a comment regarding the Environmental Impact Statement 73-054 (AFE) (refer to Exhibit No. 34). The EQB stated that the disposal of sludge at the open dump had to be discontinued. The San Germán Municipal Landfill did not comply with the state regulations and the solid wastes reach and adjacent small creek. However, there is no additional information on this matter. Mr. Angel Serrano, current Digital's Environmental Manager ignored this fact.
Conclusions and Further Actions:	Due to the facts that there is no enough information about the area and that it was used for sludge disposal from 1968 till 1974, it will be referred to the Superfund Program for further investigation.

B. <u>ACO2</u>

Unit Number: AOC-2

Unit Name: <u>MayagÜez Sanitary Landfill</u>

Unit Location: Undetermined

Unit Description: Undetermined

Reason to be Considered an Area of Concern:

The company disposed sludge at the MayagÜez Sanitary Landfill from 1975 to almost the end of 1976. The composition of the sludge was described on the "EQB's Industrial Hazardous and Toxic Waste Study" (Exhibit No. 2) as follows:

Calcium	12,300 ppm
Chromium	10 ppm
Copper	27,000 ppm
Lead	1,200 ppm
Tin	9,000 ppm
Zinc	1,800 ppm

However, there is no additional information on this matter. Mr. Angel Serrano, current Digital's environmental Manager ignored these facts.

Conclusions and Further Actions:

Due to the facts that there is no enough information about the area and that it was used for sludge disposal from 1975-1976, it will be referred to the Superfund Program for further investigation.

C. AOC3

Unit Number: AOC-3

Unit Name: Former Diesel Underground Storage Tanks Area

Unit Location: The area is located towards the northeast of the facility. See location map on Exhibit No. 29.

Unit Description: At present, there are two above-ground tanks placed horizontally in the area. Each tank has a capacity to stored 12,000 gallons of diesel. The tanks are placed over a concrete base and are surrounded by a concrete dike. See Photo No. 17, Part IV of this report.

Reason to be Considered an Area of Concern: The approximate 45 ft. by 35 ft. area formerly housed four underground tanks for the storage of diesel fuel.

On January 23, 1987, Digital reports an accidental spillage of diesel. The incident occurs on October 8th, 1986 when a one-inch pipeline from the underground storage tanks and connected to a 300 gallon aboveground storage tanks broke down (refer to Exhibit No. 11 for a copy of the report).

The underground storage tanks were removed in 1988 and a remedial action plan was submitted by the company on May 10, 1989 (Exhibit No. 19) in order to accomplish a clean closure.

The company completed the closure activities at the underground storage tank area, and it has submitted to the EQB the clean closure certification in August 1990. Also, the company has submitted a declassification petition to the EQB's Underground Storage Tank (UST) Program. The company has an Underground Injection Control (UIC) permit No. 84-0018 which is still in force.

The clean closure certification is currently being evaluated by both the UST and the Hazardous Waste Programs of the EQB.

Conclusion and Further Action:

Since the area is currently being evaluated for determination of a clean closure, no further action is recommended at this time.

VII. Summary of Conclusions and Further Actions

During the RCRA Facility Assessment (RFA) performed to Digital Equipment Corp. of San Germán, Puerto Rico, a total of eight (8) Solid Waste Management Units (SWMU's) and three (3) Areas of Concern has been identified.

Following is a summary of the environmental pathways that could be affected by the units and the recommendations made in order to minimize contamination:

UNIT	UNIT NAME	POTENTIAL RELEASE PATHWAYS	FURTHER ACTION
SWMU1	Two tanks that feed the Mecer Unit	Concrete/Soil	Adds an appropriate release control where the tank truck is placed for waste collection.
SWMU2	HWCSA	Concrete/Soil	Includes the third-compartment in the Closure Plan. Also, considers to collect concrete samples along the hazardous waste drums management pathway.
SWMU3	Satellite Area inside the Electroplating Area	Concrete Floor	Responsible for compliance with 40 CFR 262.34 (c). Inspects it in a Full RCRA TSD facility inspection.
SWMU4	Satellite Area at the Surface Mount Technology Area	Room Floor	Responsible for compliance with 40 CFR 262.34 (c). Inspects it in a Full RCRA TSD facility inspection.

SWMU5	Satellite Area at the Wave Solder Area	Cabinet Floor	Responsible for compliance with 40 CFR 262.34 (c). Inspects it in a Full RCRA TSD facility inspection.
SWMU6	Satellite Area at the WWTP	Cabinet Floor	Responsible for compliance with 40 CFR 262.34 (c). Inspects it in a Full RCRA TSD facility inspection.
SWMU7	Ignitable Waste Container Storage Area	Concrete/Soil	Includes it in the Closure Plan for the HWCSA.
SWMU8	WWTP	Concrete/Soil	No further action.
AOC1	San Germán Municipal Landfill	Soil/Sediments	Refer it to the Superfund Program.
AOC2	MayagÜez Sanitary Landfill	Undetermined	Refer it to the Superfund Program.
AOC3	Former Diesel Underground Storage Tanks Area	Soil	Clean Closure Certification is being evaluated. No further action.

REFERENCES

1) "Comments on the RFA Report for Corporación Sublistática", EPA -Region II, 1988

2) Soil Survey of MayagÜez Area of Western Puerto Rico (Sheet No. 61), United States Department of Agriculture, Soil Conservation Service in cooperation with University of Puerto Rico - College of Agriculture Science, 1969.

3) Final Draft, Site Inspection Report, Digital Equipment Corporation, San Germán, P.R., Technical Directive Document No. 02-8811-23, Contract no. 68-01-7346, NUS Corporation, Superfund Division, August 4, 1989.

4) Geohydrologic Study, Digital Equipment Corporation, San Germán, Goldberg-Zoino and Associate, Inc., Newton Upper Falls, Massachussetts, File No. A-3675.2, November 1983.

ATF/eas

EXHIBITS

1) Location Map

2) EQB's Industrial Hazardous and Toxic Waste Study, dated January 30, 1975

3) Industrial Waste Survey, February 18, 1980

4) Original Notification of Hazardous Waste Activity, August 13, 1980

5) Original Part A permit application, November 17, 1980

6) Letter from Digital to EPA, San Juan, dated December 19th, 1983 (Board Shop Incident Remedial Action)

7) Part A Permit Revision Inspection Report, dated March 24, 1982

8) RCRA Generator Inspection Form, September 16, 1981

9) EPA Letter (dated January 5, 1982) about violation encountered during inspection performed on September 16, 1981

10) Summary of Findings from Inspection performed on May 11, 1982

11) Report on Accidental Diesel Spill at Digital, dated January 23, 1987

12) Administrative Order DL-87-004-006, dated March 16, 1987

13) Report on accidental spill of concentrated Sulfuric Acid occurred on February 25, 1988 at Digital, San Germán.

14) EQB's response letter to Digital consultation request regarding off-spec circuit boards, dated January 7, 1988

15) Full RCRA Generator and TSDF inspection performed on May 2, 1988

16) Report on accidental spill of used etcher solution occurred on October 27, 1988 at Digital, San Germán

17) EQB's approval for disposition of fuel-impregnated soil into a Municipal Landfill, December 16, 1988

18) Digital's report of accidental spillage of Sulfuric acid, dated May 3, 1989

19) Remedial Action Plan for the SGO's Underground Tank Area at Digital Equipment Corporation, dated May 10, 1989

20) Digital's agreements with EQB in regard to the Remedial Action Plan, dated May 25, 1989

21) Revised Part A permit application form, signed October 27, 1989

22) PFE permit no. PFE-64-0485-0348-I-II(0), issued on November 13, 1989

23) PFE permit no. PFE-LC-RM-64-0190-0046-I-II-0, issued on January 24, 1990

24) Computer List of the Hazardous Wastes manifests

25) Field Report and Boring Logs from reference No. 4

26) Pictorial Description of the general soil conditions from reference No. 4

27) Three-Mile Vicinity Map (PRASA wells)

28) Well Locations Diagram

29) Facility Pot Plan

30) Drawing of the Hazardous Waste Storage Area

31) Complete Description of the Wastewater Treatment Unit

32) Schematic Drawing of the Original WWTP

33) EQB's Inspection Report, dated March 20, 1981

34) EQB's comments on the Environmental Impact Statement 73-054(AFE)

35) EPA's Inspection Report, dated August 31, 1984

36) Order To Do and Show Cause, DL-88-004-007 (Resolution and Notification)

ATF/eas

APPENDICES

A. RCRA Facility Assessment's Inspection Report, Digital Equipment Corporation, San Germán, P.R. May 17, 1990

ATF/eas

EXHIBIT NO. 1

DIGITAL EQUIPMENT CORPORATED
SAN GERMAN MANUFACTURING PLANT

EXHIBIT NO. 2

6-03-03-72

ENVIRONMENTAL QUALITY BOARD
OFFICE OF THE GOVERNOR
SOLID WASTE PROGRAM

INDUSTRIAL HAZARDOUS AND TOXIC WASTE STUDY

GENERAL INFORMATION

Industry Name: Digital Equipment Corp. San [illegible]

Local Address: Carr. [illegible], San Germán

Postal Address: P.O. Box 106, San Germán [illegible]

Telephone Number: 892-1946

Type of Industry: Electronics

Principal Product: Computadoras [illegible]

~~Owner of~~ General Manager: Richard W. Eaton

Person (s) Responsible for the Hazardous or Toxic Waste Management: [illegible] y Ramón [illegible] (asesor)

Total Number of Employees: 1,700

Number of Employees Working Directly with the Hazardous or Toxic Wastes: 4

(con [illegible])

[illegible]

+ [illegible] permanentes [illegible]

STORAGE FACILITIES

I RAW MATERIAL

A) Storage Station

Location [illegible]

Condition [illegible]

Containers [illegible]

Comments [illegible]

II Hazardous and Toxic Wastes Storage or Re-use

A) Storage

Containers :

Type

Location

B) Re-use [illegible]

Description ① Tricloroetileno = 200 gls/mes / 70 [illegible]

② Residuo [illegible] [illegible]

③ Gas (por [illegible]olisis)

Collection Facilities

( ) Municipal System

(✓) Same Industry [illegible] Licence #

(✓) Private System [illegible] Licence #

Other

Equipment Description : [illegible]

Collection Frequency 34 m3/dia

FINAL DISPOSAL OF TREATMENT

SITE ON	SITE OFF		SITE ON	SITE OFF	
( )	(X)	Open Burning Dump	( )	( )	Open Dump
( )	(✓)	Land-fill	( )	( )	Mine Disposal
( )	( )	Incineration	(✓)	( )	Recovery & Re-use
(X)	( )	Compaction	( )	( )	Lagooning as ultimate disposal
( )	( )	Ocean Dumping	( )	( )	Chemical & Biological Detoxification
( )	( )	Sanitary Sewage	(X)	( )	Other "[illegible]" [illegible]

"Sludge" en Mayagüez [illegible]

System Description: [illegible]

Comments: [illegible] hasta que se [illegible] [illegible] [illegible] agricultor.

Special Treatment: Reverse Osmosis = [illegible] [illegible] resultando este [illegible] [illegible] en forma de [illegible].

Comments: [illegible] (s) que [illegible] el aceite.

Person Interviewed: [illegible]

Position: [illegible] Manager / Plant [illegible]

Date: 30 de Enero de 1995

Oficial: [illegible]

Industry Name

S.I.C. & Grouping

Principal Product

Waste Identifier:
G L S

Constituents	Production	Concentration (ppm o/o)	T. L. V. (ppm)	Provisional Limit (E.P.A.): Air	Provisional Limit (E.P.A.): Water	Provisional Limit (E.P.A.): Soil	Health Hazard: Acute, Local: T	Health Hazard: Acute, Local: TR	Health Hazard: Acute, Systemic: T	Health Hazard: Acute, Systemic: TR	Health Hazard: Chronic, Local: T	Health Hazard: Chronic, Local: TR	Health Hazard: Chronic, Systemic: T	Health Hazard: Chronic, Systemic: TR	Environmental Hazard: Fire	Environmental Hazard: Explosion	Environmental Hazard: Disaster	Physico - Chemical Characteristics	Recommended Treatment
[illegible]	350 [illegible]																		
[illegible]	12 [illegible]																		
[illegible]		[illegible]																	
[illegible]		10																	
[illegible]		[illegible]																	
Cobre		[illegible]																	
Plomo		[illegible]																	
[illegible]		1200																	
Zinc																			

[illegible]

Health Hazard Analysis

T	Toxicity	T.R.	Toxicity Rating
All	Allergen	U	Unknown
IRR	Irritant	O	No toxicity
ING	Ingestion	1	Slight Toxicity
INH	Inhalation	2	Moderate Toxicity
S.A.	Skin Absorption	3	Severe Toxicity

Environmental Hazard Value Fire, Explosion and Disaster

0	None
1	Slight
2	Moderate
3	Dangerous

EXHIBIT NO. 3

digital
de PUERTO RICO

18 de Febrero de 1980

Sr. Jaime L. Ortiz
Junta de Calidad Ambiental
Apartado 11488
Santurce, P.R. 00910

Estimado Sr. Ortiz:

Le estoy incluyendo el cuestionario entregado a nosotros, por un empleado de su agencia, con la información que a nuestro entender solicitan en el mismo.

Deseo indicarle que el análisis de los cienos será enviado a su agencia tan pronto el laboratorio nos remita los resultados de la muestra.

Originalmente habiamos enviado muestras de los cienos al laboratorio pero entendemos de su comunicación que también solicitan ustedes muestras del afluente y efluente de la planta de tratamiento. Estas últimas muestras han sido tomadas y estan siendo enviadas al laboratorio para el correspondiente análisis.

Quedando a sus ordenes,

Atentamente,

José R. Zayas
Gerente de Facilidades

cet

DIGITAL EQUIPMENT CORPORATION de PUERTO RICO
POST OFFICE BOX 106, SAN GERMAN, PUERTO RICO 00753
(809) 892-1946 TWX: 385-4439 DIGITAL PR

Junta
de Calidad
Ambiental

INDUSTRIAL WASTE SURVEY

Digital Equipment Corporation de P.R.

Property Name: P.R. Industrial Development

Local Address: Route 362, San Germán

Postal Address: P.O. Box 106, San Germán, P.R. 00753

Telephone Number: 892-1946 Electronic

1. Printed Circuit Boards

2. 5.

3.

Primary SIC's:

José R. Zayas

Facilities Manager - 892-1946

Official in Charge of Environmental Affairs: José R. Zayas

Facilities Manager - 892-1946

Title

Number of Employees (Annual Average): 1840

Number of years of Industry in operation at this site: 11 Years

A. Storage of Raw Material:

1. Wherein your facility is your raw material storage located?

At plant site; electronics components inside.

Comments: Building, chemicals in drums in areas annex to building.

2. Raw Materials and Chemicals used in manufacturing processes:

(Note: Please list in descending order of volumes)

a. Electronic Components	d. Batyl Sellosolve	g. Nitric Acid	j.
b. Laminant	e. Sulfuric Acid	h. Phosphoric Acid	k.
c. Caustic Soda	f. Hydrochloric Acid	i. Formaldehide	l.

Others: Chromic Acid, Ammonium Chloride + Ammonia Gas, Copper Sulfate.

3. Process System Descriptions:

For raw materials use Chemicals used for electroplating processes and electronic components for assembly type processes.

4. Environmental Residuals from Scrubbing or Filtering Systems:

Describe Physical and Chemical Nature of this residual: Scrubbers water containing washed fumes from chemicals depicted in A-2.

5. Contingency Plans for Emergencies Floor spill collection and treatment system .

B. On-Site Waste treatment capabilities:

1. Type os Treatment Plant (Name of Vendor or Patented System) ________

Lancy Systems, Lancy Laboratories (Addrem)

2. Treatment Processes:

☐ Centrifuge	☐ Evaporation	☐ Incinerator (Type)
☒ Neutralization	☒ Biodegradation	☒ Recovery
☒ Gravity Separation	☒ Oxidation/Reduction	☐ Other
		☐ No treatment at this time

C. If No on B-2 then when do you expect to begin treatment? ________

N/A

D. Industrial Wastes:

1. Industrial Wastes disposed of by plant? Solid waste from domestic (trash, etc.) and chemical residuals.

Type of Waste Disposed:	Quantity (Cubic yards if sludge or solids, gallons if liquid)
a. Solid Waste	a. 80 cubic yrds. compacted per week
b. Sludge	b. 6,000 gals/week
c. Spent Etchant slurries	c. 20,000 gals/month
d. Copper Sulfate	d. 110 gals/week
e.	e.

2. Hazardous or toxic properties of wastes:

[ ] flammable	[X] corrosive/irritant
[ ] explosive	[X] reactive
[X] toxic	[ ] Bacterial, Viral

3. Does your operation's waste generation rates change seasonally? .... Yes [ ] No [X]

4. If yes, how and when does it change? N/A (time - period)

5. How are your operation's wastes stored prior to disposal/transportation?

Barrels (not steel) [X]	Special packaging [ ]
Concrete encases [ ]	Steel drums [ ]
Open yard [ ]	Tanks [X]
Plastic encased [X]	Warehouse [ ]
Lagoon [ ]	Other ________ (specify)
Pressure vessels [ ]	

6. Are wastes combined in storage? Yes [ ] No [ ]

7. How long are the wastes stored on site? One month (specify)

8. Typical volume of wastes stored? (cubic yards) [ ] (gallon) [X]

9. Is storage site diked? Yes [ ] No [X]

10. Is there any controlled surface drainage collection? Yes [X] No [ ]

11. System Description for storage (if yes) Sump, sump pump, collecting trenches and piping to connect to treatment plant.

12. Annual waste production __________ Cu Yds./yr 1,600,000 gal/yr.

13. Dialy " " __________ Cu Yds/yr 4,383 gal/day

14. Frecuency of waste production:

[ ] seasonal [ ] occasional

[x] continual [ ] other (specify) __________

15. Contingency Plans for Emergencies in waste storage. Yes [ ] No [X]

D. Waste composition:

1. Physical State:

[X] liquid [x] sludge [ ] gases

[X] slurry [X] solid other __________ (specify)

2. What is the percent of total moisture of the waste immediate to disposal operations? 85%

3. What is the approximate Boiling Point (if applicable) N/A, Flash Point Temperature __________, Percentage of Solids __________(I.A.), Viscosity Ranges __________ (Units).

4. Waste pH range 6.5 to 9.5.

5. Major Chemical Component (of wastes) Average Concentration Mass Weight % ppm (add additional sheets for this answer following the same format if necessary)

Metals are Mixed

	Major Chemical Component (of wastes)	Average Concentration	Mass Weight %	ppm
Sludges	Copper Hydroxide	35% Cu^{++}		15 ppm
"	Chromium Hydroxide	22% Cr^{+++}		10 ppm
"	Lead Hydroxide	5%		2 ppm
	Stannous Oxide	10%		4 ppm
	Nickel	1%		1 ppm

W/T of 2000 gals. of sludge

$$(2000)\ (1.2\ \text{sp. gr.})\ (8.35\ \frac{\text{WT Onegal}}{H_2O}) = 20{,}040\ \text{lbs.}$$

6. The information in item #5 Page 5 is: ☒ estimated

☐ calculated

☐ exact

E. Disposal On-Site: (Attach rough sketch of land disposal area showing location and distance to surface water, soil classification, direction of groundwater, flow, location of monitoring wells). N/A

1. Does disposal site have a liner? Yes ☐ No ☐

2. Type of liner? ____________________

3. Leachate collection: Yes ☐ No ☐

4. Leachate treatment: Yes ☐ No ☐

   (a) Type of treatment upon leachate effluent (if yes) ____________________

   ____

   ____

5. Groundwater monitoring wells: Yes ☐ No ☐

   (a) Number of wells: ____________________

6. Attach description of the Emergency action plan.

F. Off-site facility receiving your wastes:

1) Name of facility Sabana Grande Dump Yard

2) Operator Name Sabana Grande Municipal Government

3) Location Sabana Grande

4) Wastes that they receive Solid domestic trash plus on sludge

5) Methos of disposal Sanitary land fill and trench

____

6) Does this disposal site have a liner? Yes ☐ No ☒

7) Type of liner: ______

8) Leachate Collection: Yes ☐ No ☒

9) Leachate Treatment: Yes ☐ No ☒

a) Type of treatment: ______

G. Transportation

1. Name of waste hauler: Pozo Septico

a) Address: ______

b) Hauler's Licence #: None

2. Shipping containers:

a) Type Tank Truck

b) Capacity 3,000 gals.

H. What materials are recovered or recycled from your operations wastes?

	By Whom? Company name	Quantity/frec.
1. Copper (Cu^{++}) Slurries	Southern Cal	20,000 gals/month
2. Gold Solution	Refinement International	1,000 gals/yr.
3. Router + Drilling dusts		
4. Scrap Materials		
5.		
6.		
7.		
8.		

9. Reuse of empty containers Yes [x] No [ ]

10. Are they detoxified? Yes [x] No [ ]

11. Comments: ____

____

____

REVIEWING EQB OFFICIAL: ______________________ Date __________

Signature of Official Interviewed: [signature] Date 2/18/80

EXHIBIT NO. 4

EPA U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTIFICATION OF HAZARDOUS WASTE ACTIVITY

INSTALLATION'S EPA I.D. NO.

I. NAME OF INSTALLATION

II. INSTALLATION MAILING ADDRESS

III. LOCATION OF INSTALLATION

PLEASE PLACE LABEL IN THIS SPACE

INSTRUCTIONS: If you received a preprinted label, affix it in the space at left. If any of the information on the label is incorrect, draw a line through it and supply the correct information in the appropriate section below. If the label is complete and correct, leave Items I, II, and III below blank. If you did not receive a preprinted label, complete all items. "Installation" means a single site where hazardous waste is generated, treated, stored and/or disposed of, or a transporter's principal place of business. Please refer to the INSTRUCTIONS FOR FILING NOTIFICATION before completing this form. The information requested herein is required by law *(Section 3010 of the Resource Conservation and Recovery Act).*

DETACH

FOR OFFICIAL USE ONLY

COMMENTS

C

INSTALLATION'S EPA I.D. NUMBER	T/A	C	APPROVED	DATE RECEIVED (yr., mo., & day)
F		1		

I. NAME OF INSTALLATION

Digital Equipment Corporation

II. INSTALLATION MAILING ADDRESS

STREET OR P.O. BOX

3 PO Box 106

CITY OR TOWN	ST.	ZIP CODE
4 San German	PR	00753

III. LOCATION OF INSTALLATION

STREET OR ROUTE NUMBER

5 KM 1.0 Road 362

CITY OR TOWN	ST.	ZIP CODE
6 San German	PR	00753

IV. INSTALLATION CONTACT

NAME AND TITLE (last, first, & job title)	PHONE NO. (area code & no.)
2 Luis R Lopez Principal Fac Eng	809-892-3510

V. OWNERSHIP

A. NAME OF INSTALLATION'S LEGAL OWNER

8 Digital Equipment Corp de Puerto Rico

DETACH

B. TYPE OF OWNERSHIP (enter the appropriate letter into box)

F = FEDERAL
M = NON-FEDERAL

M

VI. TYPE OF HAZARDOUS WASTE ACTIVITY *(enter "X" in the appropriate box(es))*

[X] A. GENERATION
[ ] B. TRANSPORTATION *(complete item VII)*
[X] C. TREAT/STORE/DISPOSE
[ ] D. UNDERGROUND INJECTION

VII. MODE OF TRANSPORTATION *(transporters only – enter "X" in the appropriate box(es))*

[ ] A. AIR [ ] B. RAIL [ ] C. HIGHWAY [ ] D. WATER [ ] E. OTHER *(specify)*:

VIII. FIRST OR SUBSEQUENT NOTIFICATION

Mark "X" in the appropriate box to indicate whether this is your installation's first notification of hazardous waste activity or a subsequent notification. If this is not your first notification, enter your Installation's EPA I.D. Number in the space provided below. new PRD 991291857

[X] A. FIRST NOTIFICATION
[ ] B. SUBSEQUENT NOTIFICATION *(complete item C)*

C. INSTALLATION'S EPA I.D. NO.

IX. DESCRIPTION OF HAZARDOUS WASTES

Please go to the reverse of this form and provide the requested information.

CONTINUE ON REVERSE

IX. DESCRIPTION OF HAZARDOUS WASTES *(continued from front)*

A. HAZARDOUS WASTES FROM NON–SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.31 for each listed hazardous waste from non–specific sources your installation handles. Use additional sheets if necessary.

1	2	3	4	5	6
F001	F002	F006	F007	F008	F009
7	**8**	**9**	**10**	**11**	**12**

B. HAZARDOUS WASTES FROM SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.32 for each listed hazardous waste from specific industrial sources your installation handles. Use additional sheets if necessary.

13	14	15	16	17	18
19	**20**	**21**	**22**	**23**	**24**
25	**26**	**27**	**28**	**29**	**30**

C. COMMERCIAL CHEMICAL PRODUCT HAZARDOUS WASTES. Enter the four–digit number from 40 CFR Part 261.33 for each chemical substance your installation handles which may be a hazardous waste. Use additional sheets if necessary.

31	32	33	34	35	36
37	**38**	**39**	**40**	**41**	**42**
43	**44**	**45**	**46**	**47**	**48**

D. LISTED INFECTIOUS WASTES. Enter the four–digit number from 40 CFR Part 261.34 for each listed hazardous waste from hospitals, veterinary hospitals, medical and research laboratories your installation handles. Use additional sheets if necessary.

49	50	51	52	53	54

E. CHARACTERISTICS OF NON–LISTED HAZARDOUS WASTES. Mark "X" in the boxes corresponding to the characteristics of non–listed hazardous wastes your installation handles. *(See 40 CFR Parts 261.21 – 261.24.)*

- [X] 1. IGNITABLE (D001)
- [X] 2. CORROSIVE (D002)
- [ ] 3. REACTIVE (D003)
- [X] 4. TOXIC (D000)

X. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE	NAME & OFFICIAL TITLE *(type or print)*	DATE SIGNED
Edward Gavin	ENGINEERING MANAGER	8/13/80

EPA Form 8700-12 (6-80) REVERSE

Photo No 1 : Hazardous Wastes Container Storage Area (HWCSA) to be closed, looking East

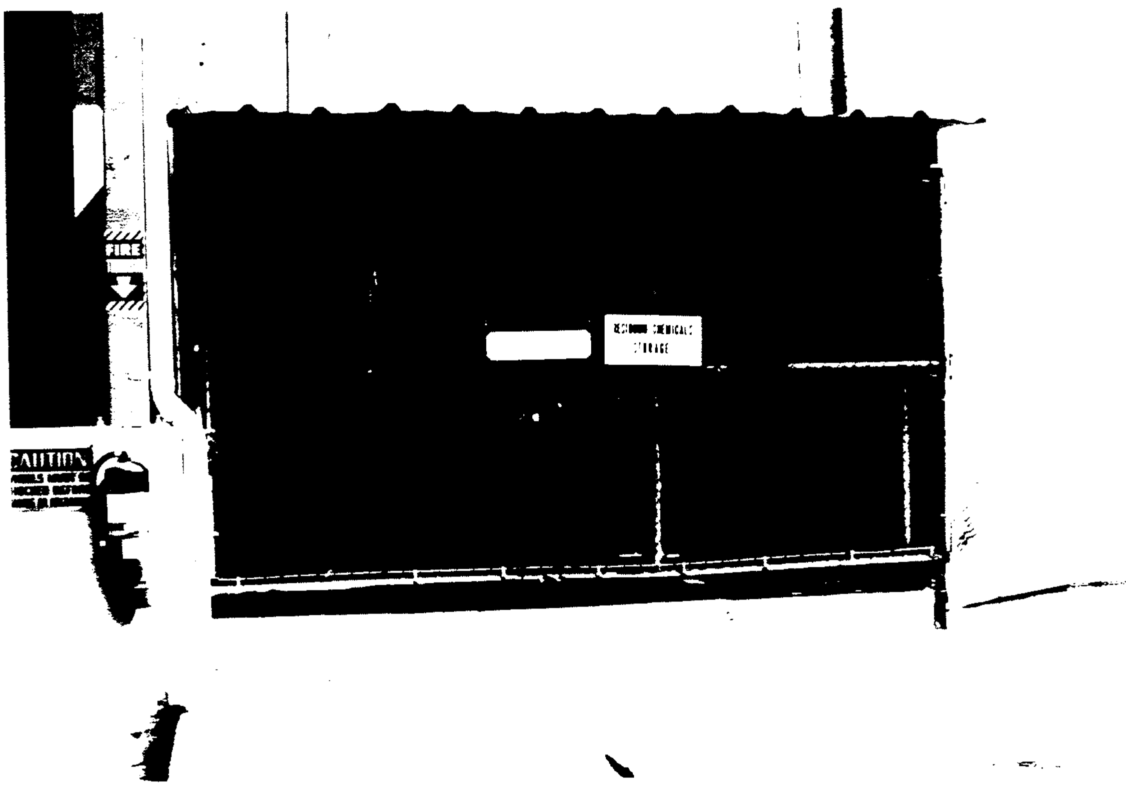


Photo no. 3 : Ignitable Wastes Container Storage Area, looking North

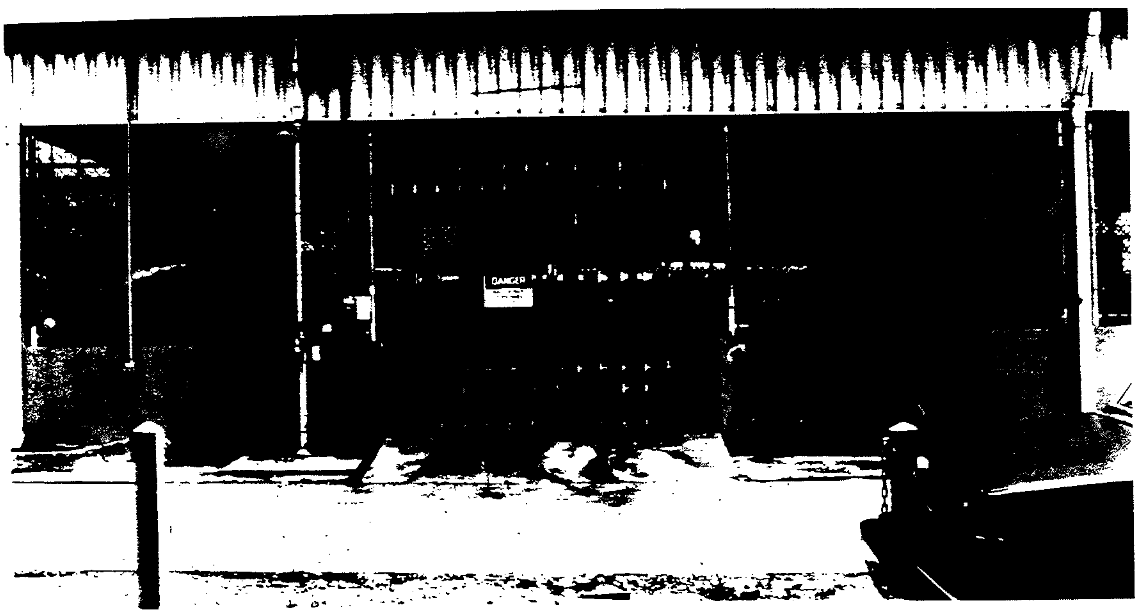


Photo no. 5 : New Hazardous Wastes Container Storage Area (New HWCSA), left section, looking South - South East

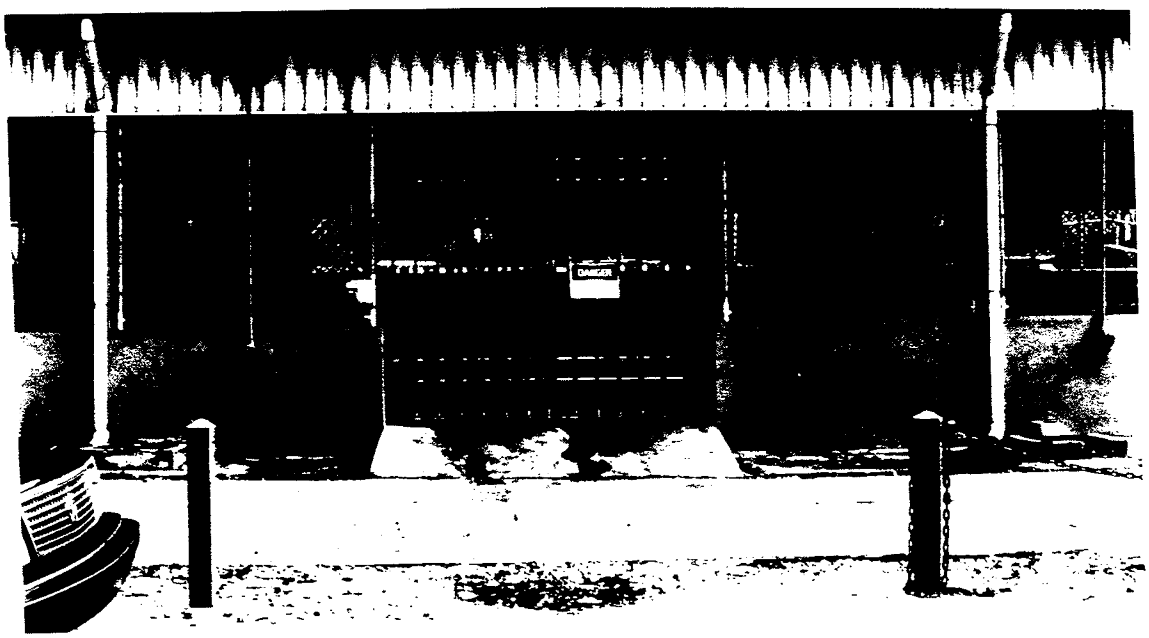


Photo no. 7 : New Hazardous Wastes Container Storage Area (New HWCSA), mid section, looking South - South East

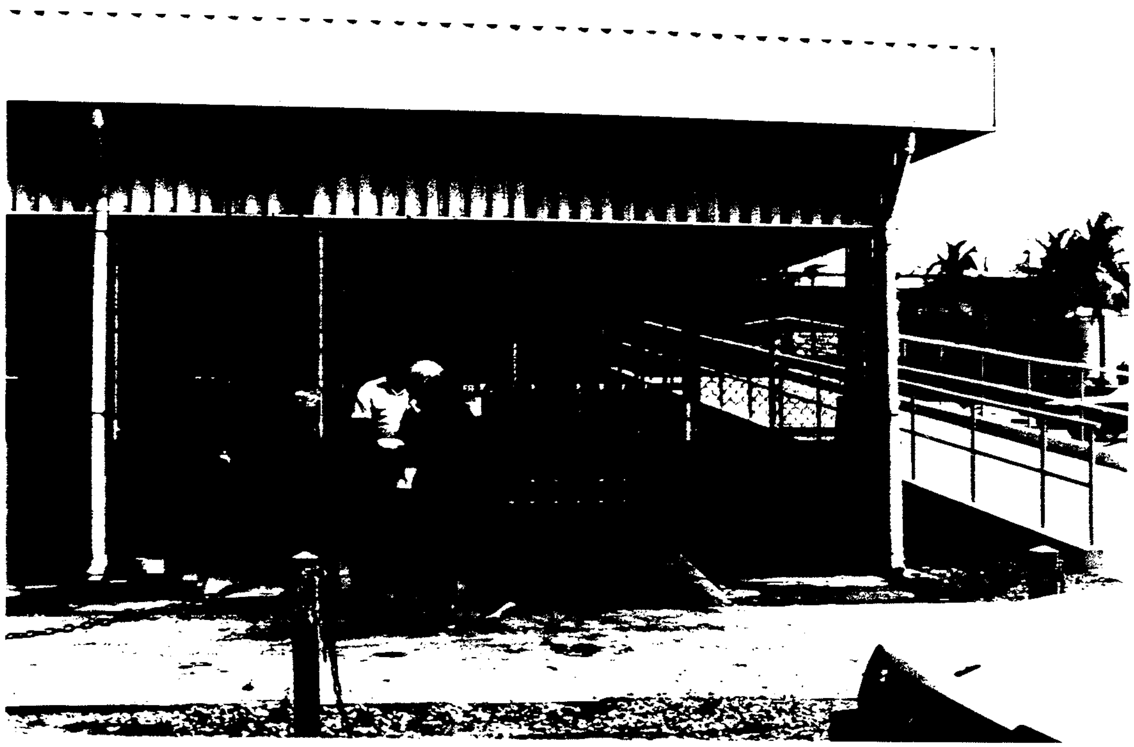


Photo no. 9 : New Hazardous Wastes Container Storage Area (New HWCSA), right section, looking South - South East.

Photo No. 11 : Spent Etchant Tank, looking East

Photo no. 13 : Used Etchant Rinse Water Tank, looking East

Photo no. 15 : Regenerated Etchant Tank,

9,000 gallon , looking South

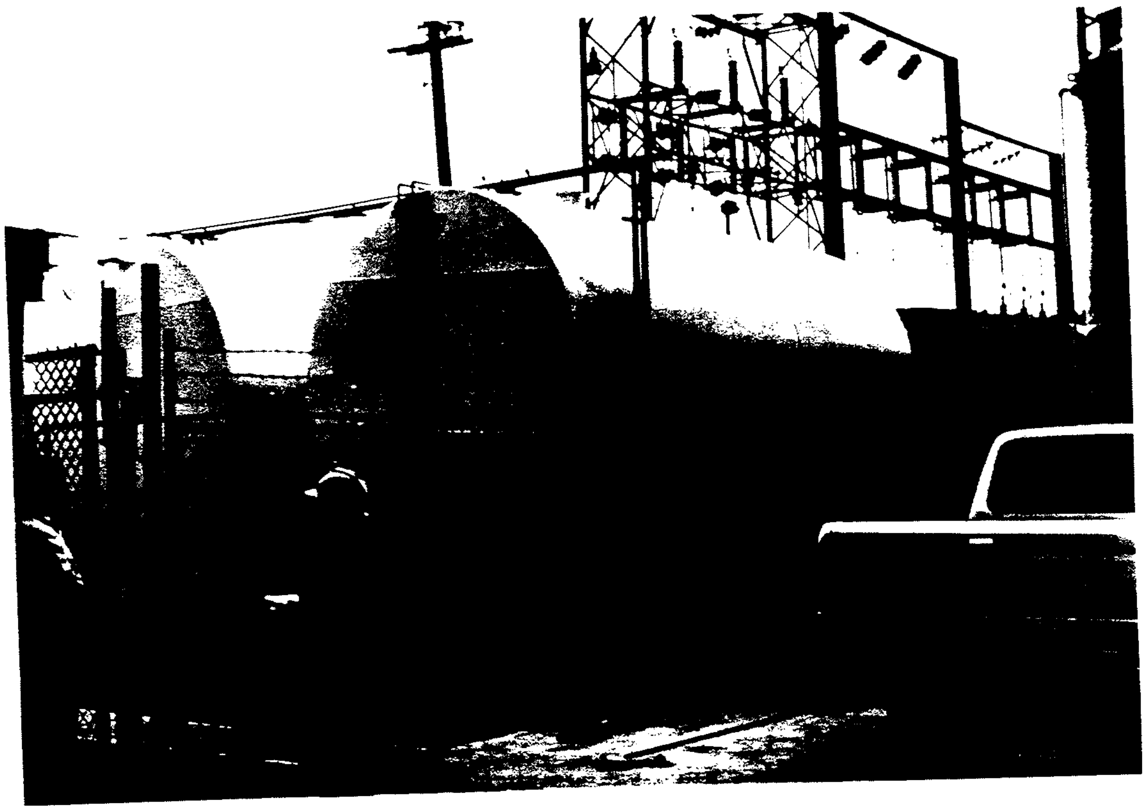


Photo no 17 : Two aboveground Diesel Storage Tanks, 12,000 gallon each, looking South - South East.
Note : Former Underground Storage Tanks area.

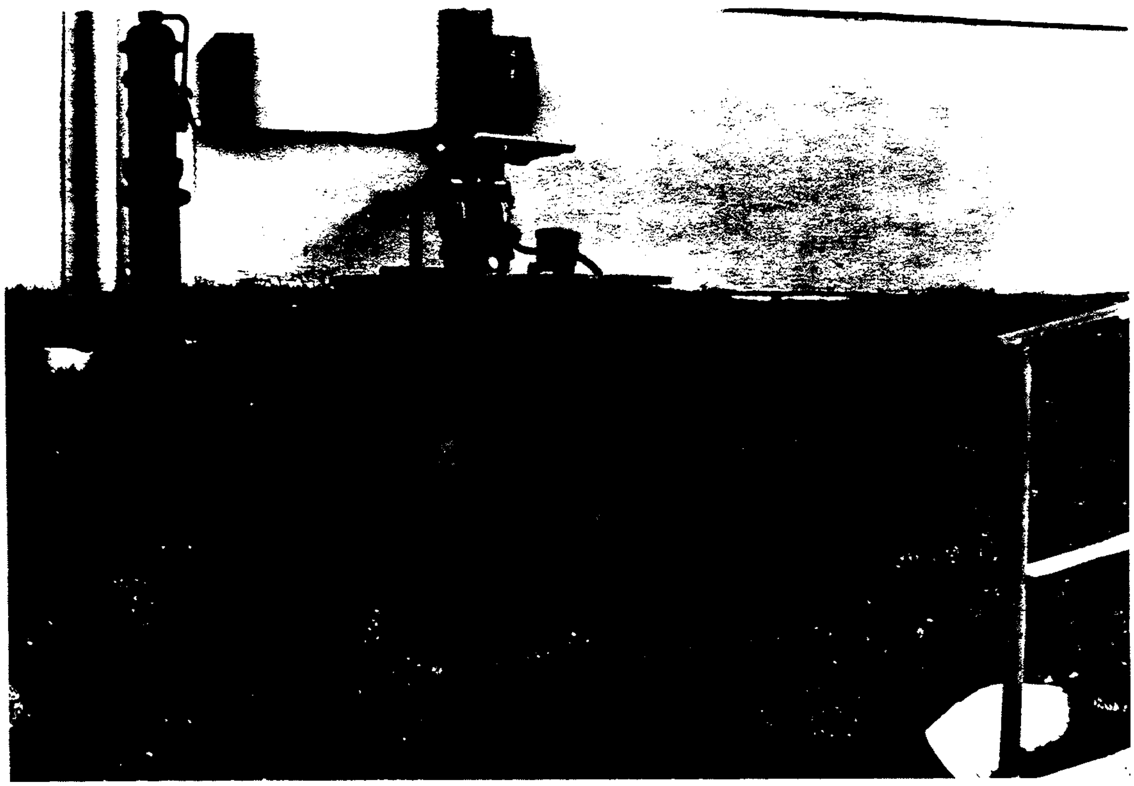


Photo No 19 : Groundwater Recovery Well, looking East

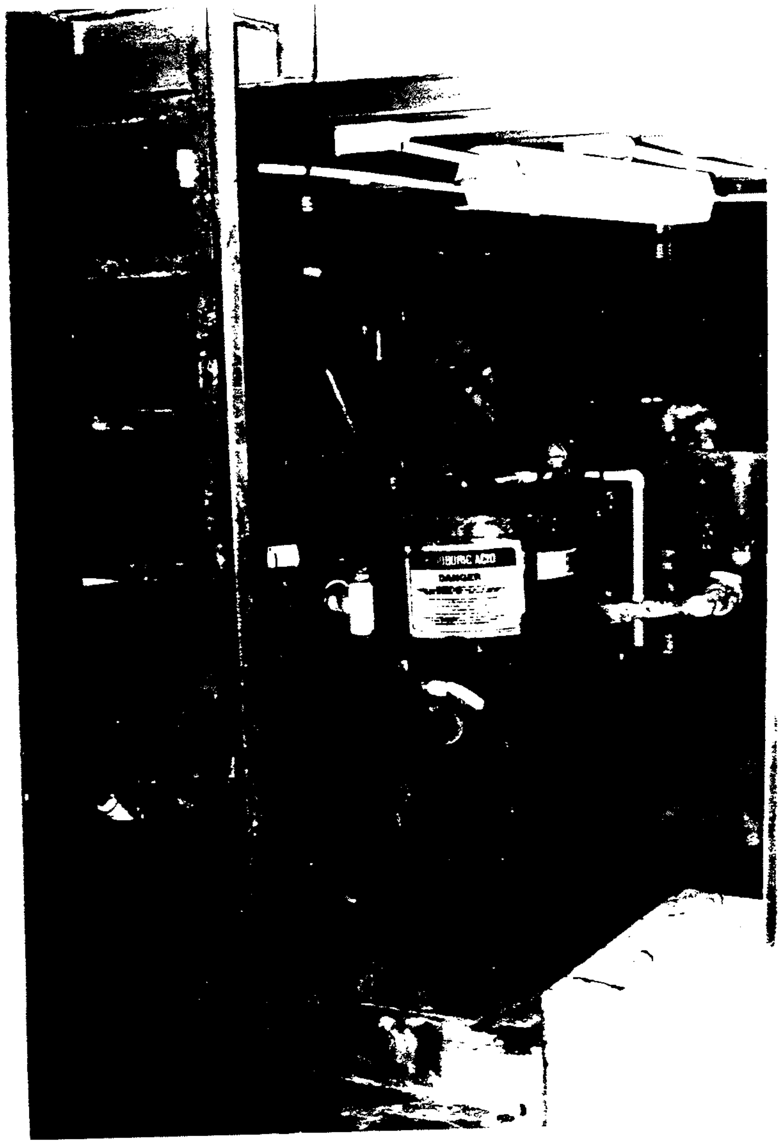


Photo no. 21 : Filters System for regeneration of Tin-Lead inside the Electroplating Room.

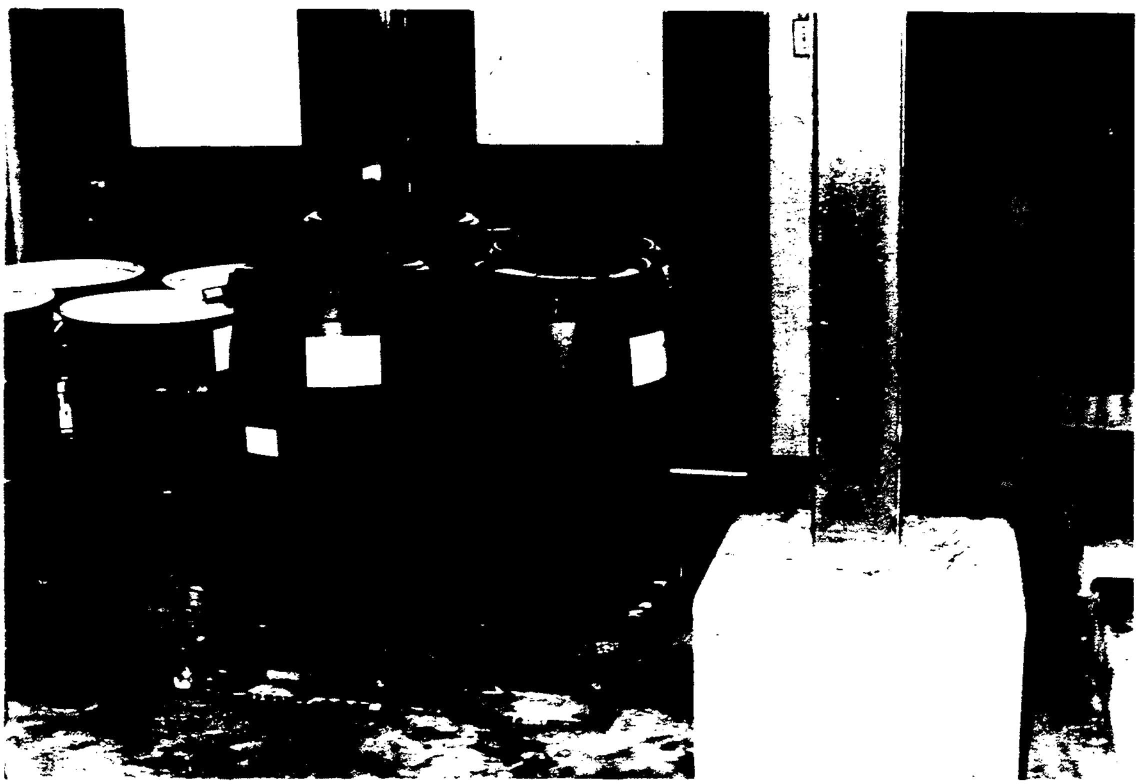


Photo no. 23 . Satellite Area inside the Electroplating Room for accumulation of spent filters from Tin/Lead regeneration.

Photo no. 25 : Warning Sign of the Satellite Area located at the Electroplating Area

Photo no. 27 : Tanks used for filters backwash in the WasteWater Treatment Plant.

Note : One of the tank was formerly used for storage of F006 sludge prior to out-site disposal

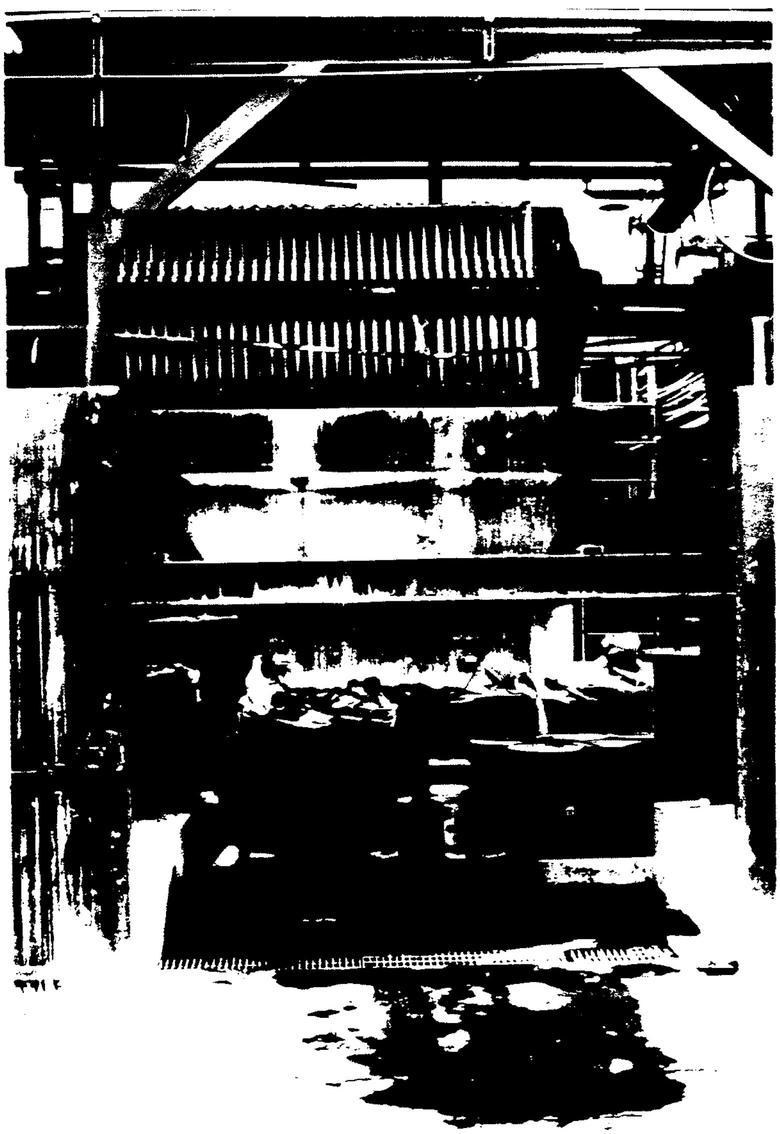


Photo no. 29 : Filter Press of the Wastewater Treatment Plant.
Note : Marino Bags full of Food sludge waste
can be observed.

Photo no 31 : Filter Press Feeding Tank, 3,000 gallon, at the Wastewater Treatment Plant.
Note : TK-23 was formerly used for storage of F006 sludge prior to out-site disposal.

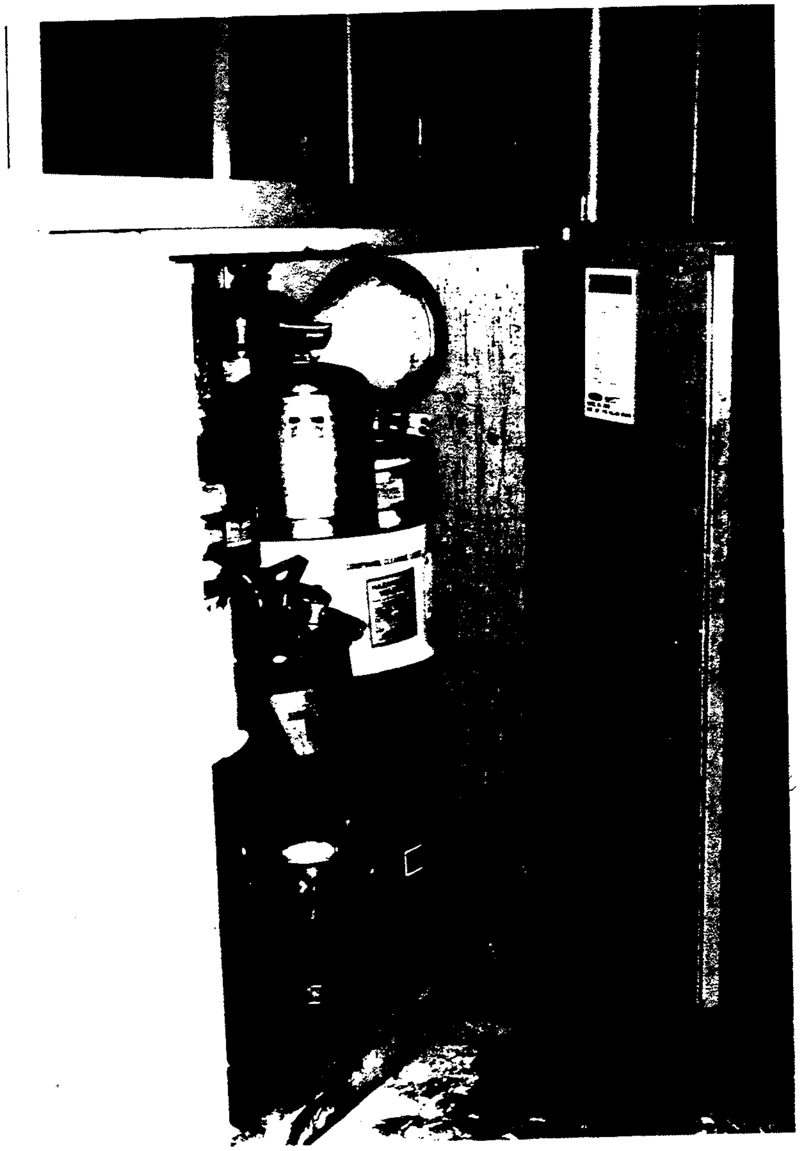


Photo no. 33 : Satellite Area for storage of Flux and Waste Oil at the Wastewater Treatment Plant.
Note : At the time of the inspection, there was a 55 gallon drum of Flux, a 55-gallon drum of Waste Oil, four Safety Cans of Waste Flammable from processess lines and others containing Freon and Methylene Chloride.

EXHIBIT NO. 5

U.S. ENVIRONMENTAL PROTECTION AGENCY

EPA GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F PRT000040543

GENERAL LABEL ITEMS

I. EPA I.D. NUMBER	PLEASE PLACE LABEL IN THIS SPACE
III. FACILITY NAME	
V. FACILITY MAILING ADDRESS	
VI. FACILITY LOCATION	

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill—in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill—in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold—faced terms.

SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X	
B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X	
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	
J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP DIGITAL EQUIPMENT CORPORATION

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 LUIS R LOPEZ PRINCIPAL FAC ENG	809 892 1946

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 PO BOX 106

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 SAN GERMAN	PR	00753

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 R Rd 362

B. COUNTY NAME

BO. GUAMA

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 SAN GERMAN	PR	00753	

CONTINUE ON REVER

A. FIRST

C		(specify)
7	3575	PRINTED CIRCUIT FACILITIES

B. SECOND

C		(specify)
7		

C. THIRD

C		(specify)
7		

D. FOURTH

C		(specify)
7		

VIII. OPERATOR INFORMATION

A. NAME

C	
8	DIGITAL EQUIPMENT CORPORATION

B. Is the name listed in Item VIII-A also the owner? ☐ YES ☒ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)

(specify)

D. PHONE (area code & no.)

C			
A	617	897	5111

E. STREET OR P.O. BOX

146 MAIN. ST

F. CITY OR TOWN	G. STATE	H. ZIP CODE
8 MAYNARD	MA	01754

IX. INDIAN LAND

Is the facility located on Indian lands?

☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)	D. PSD (Air Emissions from Proposed Sources)	
C T I: 9 N	C T I: 9 P	

B. UIC (Underground Injection of Fluids)	E. OTHER (specify)	(specify)
C T I: 9 U	C T I: 9	State Air Emission Under Processing

C. RCRA (Hazardous Wastes)	E. OTHER (specify)	(specify)
C T I: 9	C T I: 9	

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

Manufacturer of mini-computers

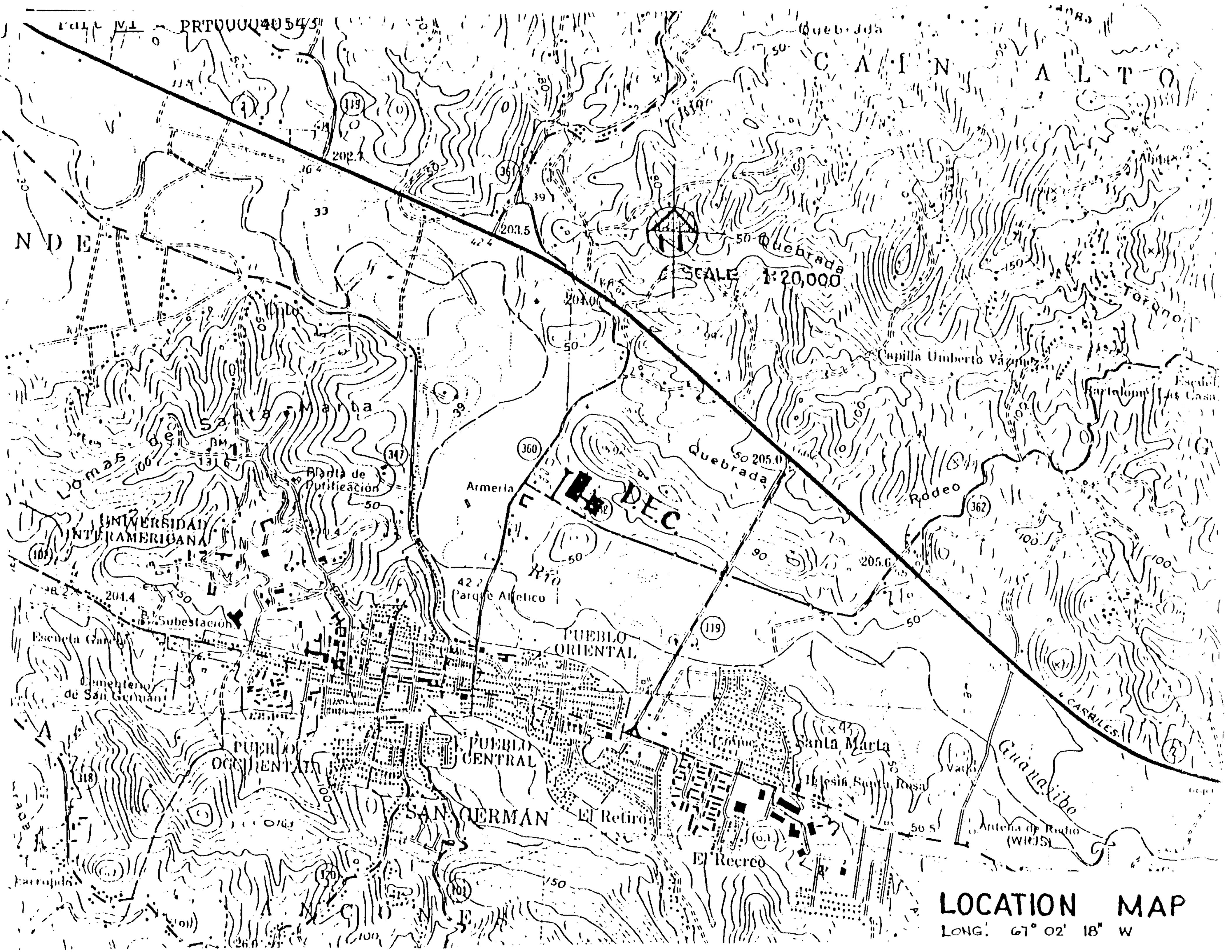
XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

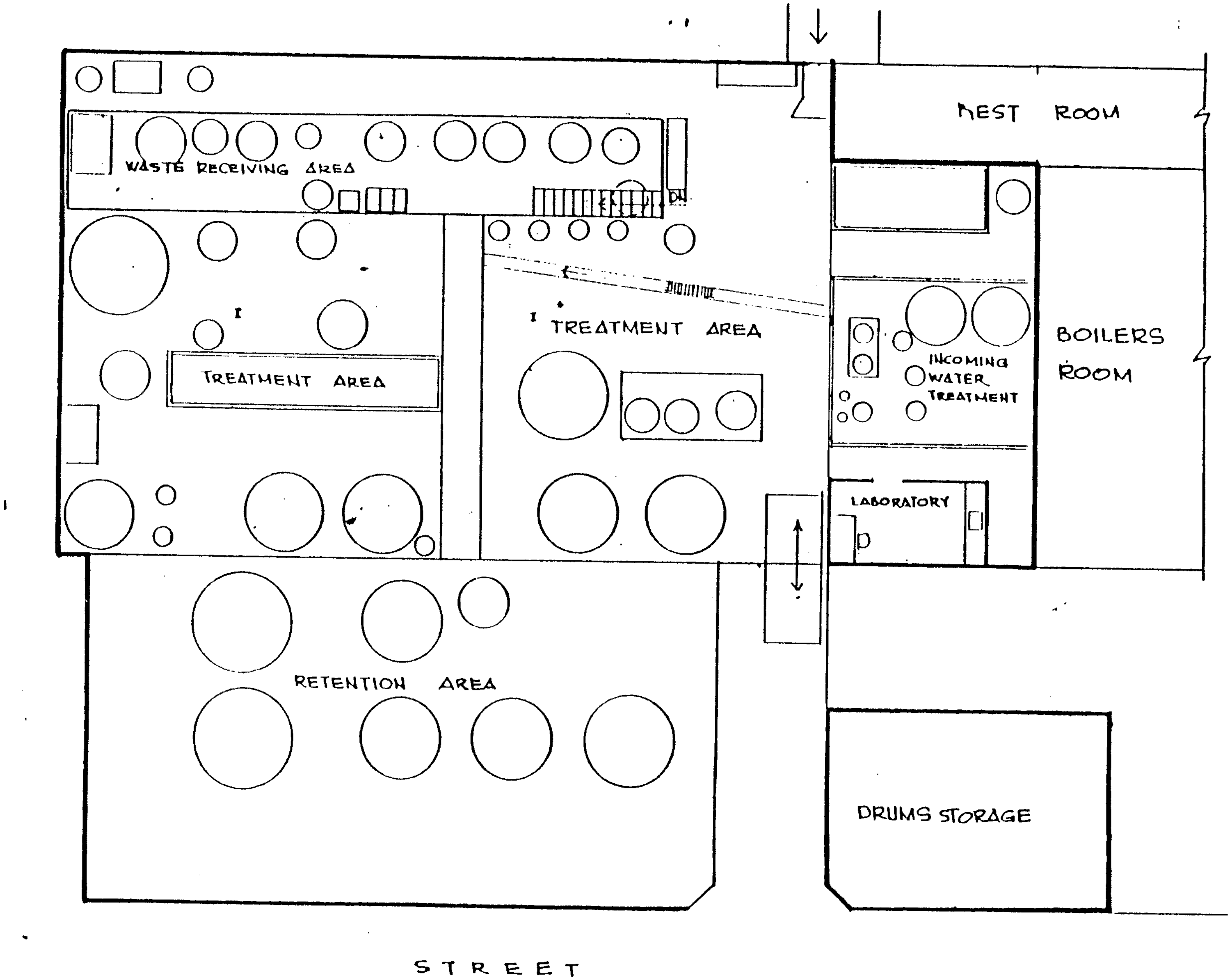
A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Iván Nazario Vice-President & Plant Manager		

COMMENTS FOR OFFICIAL USE ONLY

C



CAIN ALTO
SCALE 1:20,000
Quebrada
Capilla Umberto Vázquez
Lomas de Santa Marta
Planta de Purificación
Armería
D.E.C.
UNIVERSIDAD INTERAMERICANA
Subestación
Escuela García
Cementerio de San Germán
Parque Atlético
Río
PUEBLO ORIENTAL
Rodeo
PUEBLO OCCIDENTAL
PUEBLO CENTRAL
SAN GERMAN
El Retiro
Santa Marta
Iglesia Santa Rosa
El Recreo
Guanajibo
CASRILES
Antena de Radio (WRJS)
LOCATION MAP
LONG. 67° 02' 18" W



WASTE TREATMENT PLANT

SC. 1/16 = 1'-0" 8/26/80 S. VELAZQUEZ

3 RCRA

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY
HAZARDOUS WASTE PERMIT APPLICATION
Consolidated Permits Program
(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER

F PR T 0 0 0 0 4 0 5 4 3

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

[X] 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

[ ] 2. NEW FACILITY *(Complete item below.)*

C: 8 — YR.: 68 — MO.: — DAY:

FOR EXISTING FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

YR. — MO. — DAY

FOR NEW FACILIT PROVIDE THE DAT *(yr., mo., & day)* OPE TION BEGAN OR IS EXPECTED TO BEG

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. **PROCESS CODE** – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided fo entering codes. If more lines are needed, enter the code*(s)* in the space provided. If a process will be used that is not included in the list of codes below, th describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. **PROCESS DESIGN CAPACITY** – For each code entered in column A enter the capacity of the process.
1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PRO-CESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PRO-CESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C — DUP — 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. 1. AMOUNT (specify)	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. 1. AMOUNT	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	S 0 2	52,000	G		7				
2	S 0 1	5,000	G		8				
3					9				
4					10				

SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

IV. DESCRIPTION OF HAZARDOUS WASTES

A. **EPA HAZARDOUS WASTE NUMBER** — Enter the four–digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four–digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. **ESTIMATED ANNUAL QUANTITY** — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non–listed waste*(s)* that will be handled which possess that characteristic or contaminant.

C. **UNIT OF MEASURE** — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. **PROCESSES**

1. PROCESS CODES:
   For listed hazardous waste: For each listed hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non–listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non–listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non–listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

CONTINUE ON PAGE

Photocopy this page before completing if you have more than 26 wastes to list.

EPA I.D. NUMBER (enter from page 1)

W	P	R	T	0	0	0	0	4	0	5	4	3		1

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W | DUP | 2 | DUP

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

LINE NO.	A. EPA HAZARD. WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	F001	5,500	P	S01	
2	F002	5,500	P	S01	
3	F006	3,130	T	S02	Sludge of 10% - 12% solid weight
4	F007	5,500	P	S01	
5	F008	5,500	P	S01	
6	F009	5,500	P	S01	
7		20,000	T		Corrosive (Rinses)
8		10,000	T		Toxic (Rinses)
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

CONTINUE ON REVERSE

USE THIS SPACE TO LIST AD[DITI]ONAL PROCESS CODES FROM ITEM D( ) ON PAGE 3.

Notification of hazardous waste activity submitted before August 18th. EPA I.D. Number has not been issued as of this date.

EPA I.D. NO. (enter from page 1)

F P R T 0 0 0 0 4 0 5 4 3 | T/A | C: 6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground–level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail).*

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
18 05 30N	067 02 18W

VIII. FACILITY OWNER

☐ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left ar[nd] skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. (area code
E Digital Equipment Corporation	617-897-5[ ]

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F 146 Main St.	G Maynard	MA	01754

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Iván Nazario Vice-President & Plant Mgr.		

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Ed Gavin Eng. Manager	Ed Gavin	11/17/80

CONTINUE ON

EXHIBIT NO. 6

digital de PUERTO RICO

Dorp Sobber

December 19th, 1983

Mr. Carlos O'Neill
Environmental Engineer P.E.
U.S. Environmental Protection Agency
P. O. Box 792
San Juan, Puerto Rico

RE: DIGITAL EQUIPMENT CORPORATION
E.P.A. I.D. # PRD-991291857
"Follow-up on 22nd November 1983
E.P.A./E.Q.B. Meeting in San German"

Dear Mr. O'Neill:

This letter addresses several major points covered during our meeting in San German.

1.0 Sampling Program:

It was agreed that DEC will continue with the following sampling program:

Location	Frequency	Parameters
DEC Well #3	Bimonthly	Cu, Ni, Cr & Pb
Collection Well	Weekly	Cu, Ni, Cr & Pb

We will discontinue collecting samples off-site. This is based on the consistent absence or very low levels of metals found in the off-site wells, and the Digital well #3.

Note: We will continue performing the current sampling program until EPA decides to accept the above sampling program as proposed.

2.0 Water Collection System (Trench Project)

The key drawings, design and material specifications for our new trench system were submitted. There are three important considerations that we mentioned with the submission of this information.

RECIBIDO
JUNTA DE ... AMBIENTAL
1983
... de

DIGITAL EQUIPMENT CORPORATION DE PUERTO RICO
POST OFFICE BOX 106 SAN GERMAN PUERTO RICO 00753
809 - 892-1946 TWX: 3853944 DIGITAL PR

2.0.1 The design is submitted as proposed.

2.0.2 The January 1984 of project date is an optimistic assessment. It is possible that because of construction complexities it may slip.

2.0.3 Completed system will be certified by a registered engineer as being leak proof.

3.0 Closure Plan:

We formally recommended that the case be closed. From information-gathered to date and presented in formal reports, the following can be clearly established:

3.0.1 There has been no migration of contaminants off-site.

3.0.2 The affected area is highly localized and contained.

3.0.3 The existing groundwater removal for the plant operation acts as an ideal containment system.

3.0.4 The collection well system we agreed to operate acts as an ideal remedial action.

Note: As part of this close-out agreement, Digital will: Maintain a constant draw-down at the collection well; measure the volume of discharge from that collection system; monitor the levels of Copper, Chrome, Nickel and Lead of the effluent from the collection well; on a quarterly basis, for a period of one year, we will monitor the Nickel and Copper levels in the observation well, as follows:

a) OW-2

b) OW-103 - OW-108

c) DEC Wells 1 and 3

This sampling program will be analyzed in-house. We will continue to measure rainfall on a daily basis for one year.

All of the above information will be kept on file in Digital. In the event there is any trend indicating a problem, this information will immediately be communicated to EPA and EQB. In the event there is a problem, a new corrective plan will be formulated.

4.0 Next Meeting:

It is anticipated that our next meeting will be in mid January. You indicated that you will schedule the meeting to provide adequate time for a review by the other agencies involved in this case. Please allow me adequate time to inform our people to schedule time for this meeting, also.

It has been a pleasure working with you. If you have any question, please feel free to call.

Cordially yours,

Luis A. Ureta
Environmental Manager

LAU/emb

xc: Luis de la Cruz, E.Q.B.
✓Lourdes Figueroa, E.Q.B.
Rafael Lama, DEC
Sam Landol, DEC
Steve Greene, DEC
Jim Bishop, DEC
Foster Knight, DEC
Rafael Rodríguez, DEC
José Zayas, DEC
Luis López, DEC
Angel Serrano, DEC
Tom Huppuch, DEC

EXHIBIT NO. 7

ESTADO LIBRE ASOCIADO DE PUERTO RICO / OFICINA DEL GOBERNADOR

Junta de Calidad Ambiental

24 de marzo de 1982

MEMORANDO

A : Ing. Luis E. de la Cruz
Director
Area Contaminación de Terrenos

P/C : Sr. Beato Alvarado
Director Interino
Negociado Desperdicios Peligrosos

: Ing. Julio Díaz
Jefe Interino Sección
Permisos e Ingeniería

DE : Nohemi Zerbi de Carlo
Ingeniero Químico

ASUNTO : Digital Equipment Corp. de Puerto Rico
San Germán

El 16 de marzo del año en curso, se inspeccionó la compañía de epígrafe para cotejar la información que aparece en el "print-out" de E.P.A. de la Parte A del permiso que ellos sometieron.

La inspección resulto en una evaluación negativa de la facilidad y se le recomendará a E.P.A. a no proceder con la Parte B del permiso de ésta compañía.

Adjunto informe a ser enviado a E.P.A. sobre lo encontrado durante la inspección.

Con esto queda cerrado el expediente de permiso de Digital Equipment Corp. de Puerto Rico, hasta nueva ocasión.

Reference: Digital Equipment C.
de Puerto Rico
Id. Number:PRT 000040543

INSPECTION REPORT
FOR PERMIT

A Part A Permit Revision Inspection was performed on March 16, 1982, to the Digital Equipment Corporation de Puerto Rico facility located in San Germán, Puerto Rico. Personnel of the Hazardous Waste Division of EQB met with Eng. Steven Greene, Corporate Engineer Contact, Eng. Luis López, and Eng. Luis Ureta, Enfironmental Engineer, during the visit.

Digital Equipment Corp. is dedicated to the manufactoring of printed circuit boards using the subtractive method with electrode and electroless plating and cyanide-free etching process.

The information that appears in the E.P.A. print-out of their Part A of the permit was reviewed and the following changes were noted.

1- The facilities "owner type" status is private.

2- The contact person has changed. Now Eng. Luis Ureta, Environmental Engineer is their contact person.

3- They have a state air permit with the following No. PFE 38002141-II 0

4- The company does not use drums to store hazardous waste normally. They have a storage area with a capacity to hold 95, 55 gallon drums in case of an energency or spill.

5- They have two actual storage tanks with a combined maximum capacity of 9,000 gal.

6- They were storing, up to February of 1982, and unreported waste of "waste oils" which were labeled as toxic. They claim they have sold the waste, and will continue silling the waste, to a company to be recycled.

7- The hazardous waste they actually generated is all treated in the following manner.

	Waste	Waste Code	Quantity	T01 Treatment	Final Process
a-	Butyl	D001	2,860 gal/yr	-neutralization -polimerization -clarified -separated (F006 generated)	S02

	Waste	Waste Code	Quantity	T01 Treatment	Final Process
b-	Metal Rinses	D002	DATA	UNKNOWN	
c-	Water Rinses	D003	62,000 Tn/yr	-neutralized -clarified -separated -(Foo6 generated)	S02
d-	1-1-1-Trichloroethane	F001	6,000 Lb/yr	-pH adj -flocculation -clarified (F006 generated)	S02
e-	Acetone	F002	6,000 lb/yr	-scrubber -pH adj: -flocculation -clarifier (F006 generated)	S02
f-	Nitric Acid Tin lead chromicacid	F007	5,640 lb/yr	-varied	S02
g-	Sludge	F008	NO AVAILABLE	DATA	T01
h-	Butyl	F009	NO AVAILABLE	DATA	T01

8- The F006 waste water treatment sludge generated form the above processes is generated at a rate of 2,079 ton/yr. This waste is stored in storage tanks and then transported to a surface impoundment they own located at the municipal dump of Sabana Grande. This facility has an E.P.A. Id. number of its own. They have three (3) actual surface impoundments with a total capacity of 3/4 of a million gallons. None of the impoundments are linned and they do not have a ground water monitoring system nor a leachate collection system for this area.

On March 12, 1982, the company submitted to E.P.A. a delisting pettition for their F006 waste disposed of at the Sabana Grande surface impoundments.

It was recommended that the company submitt to E.P.A. an updated version of their Part A. permit application in which they specified all the changes that have occured.

RECOMMENDATION:

We believe that Digital equipment Corp. is not, at this moment a RCRA permit issuable facility due to the various treatment process they give to their hazardous waste which at present are not being regulated. Therefore we recommend that no further permit procedures be continued.

EXHIBIT NO. 8

RCRA GENERATOR INSPECTION

EPA I.D. NUMBER: PRT000040543

COMPANY NAME: DIGITAL EQUIPMENT CORP.

COMPANY ADDRESS: KM 1.0 ROAD 362
P.O. BOX 106
SAN GERMAN, P.R.

INSPECTOR'S NAME: J. COSENTINO
A. MORALES

COMPANY CONTACT OR OFFICIAL:
LUIS R. LOPEZ

BRANCH/ORGANIZATION: E.P.A.
SURVEILLANCE & MONITORING

TITLE: MANAGER
PRINCIPAL FACILITIES ENGR.

DATE OF INSPECTION: 9-16-81

CHECK IF FACILITY IS ALSO A TSD FACILITY [√]

	YES	NO	DON'T KNOW
(1) Is there reason to believe that the facility has hazardous waste on site?	√		

a. If yes, what leads you to believe it is hazardous waste? Check appropriate box:

[√] Company admits that its waste is hazardous during the inspection.

[√] Company admitted the waste is hazardous in its RCRA notification and/or Part A Permit Application.

[ ] The waste material is listed in the regulations as a hazardous waste from a nonspecific source (§261.31)

[ ] The waste material is listed in the regulations as a hazardous waste from a specific source (§261.32)

[ ] The material or product is listed in the regulations as a discarded commercial chemical product (§261.33)

[ ] EPA testing has shown characteristics of ignitability, corrosivity, reactivity or extraction procedure toxicity, or has revealed hazardous constituents (please attach analysis report)

[ ] Company is unsure but there is reason to believe that waste materials are hazardous. (Explain)

Part V - PRT0...

	YES	NO	DON'T KNOW
b. Is there reason to believe that there are hazardous wastes on-site which the company claims are merely products or raw materials?		✓	

Please explain:

c. Identify the hazardous wastes that are on-site, and estimate approximate quantities of each.

WASTE FLUX OIL ABOUT 40 DRUMS
ALTHOUGH EXEMPT AS A WASTE OIL, COMPANY HAS TESTED AND FOUND IT TO BE EP TOXIC BECAUSE OF LEAD (Pb) CONCENTRATION

d. Describe the activities that result in the generation of hazardous waste.

CONSTRUCTION OF COMPUTER CIRCUIT BOARDS

	YES	NO	DON'T KNOW
(2) Is hazardous waste stored on site?	✓		
a. What is the longest period that it has been accumulated? SINCE NOV. 19			
b. Is the date when drums were placed in storage marked on each drum? SOME NOT ALL		✓	
(3) Has hazardous waste been shipped from this facility since November 19, 1980?		✓	

a. If "yes," approximately how many shipments were made?

— NONE —

COMPANY IS STORING THEIR WASTE FLUX OIL UNTIL THEY CAN FIND SOMEONE TO TREAT.

(4) Approximately how many hazardous waste shipments off site have been made since November 19, 1980? 0

	YES	NO	DON'T KNOW
a. Does it appear from the available information that there is a manifest copy available for each hazardous waste shipment that has been made? NONE MADE SINCE NOV. 19			

b. If "no" or "don't know," please elaborate.

CONTINUE ON REVERSE

	YES	NO	DON'T KNOW
FACILITY HAS NOT YET SHIPPED ANY HAZARDOUS WASTE, HOWEVER ALL WASTE IS SHIPPED WITH MANIFEST			
c. Does each manifest (or a representative sample) have the following information?			
– a manifest document number	✓	___	___
– the generator's name, mailing address, telephone number, and EPA identification number	✓	___	___
– the name, and EPA identification number of each transporter	✓	___	___
– the name, address and EPA identification number of the designated facility and an alternate facility, if any:	✓	___	___
– a description of the wastes (DOT)	✓	___	___
– the total quantity of each hazardous waste by units of weight or volume, and the type and number of containers as loaded into or onto the transport vehicle	✓	___	___
– a certification that the materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation under regulations of the Department of Transportation and the EPA	✓	___	___
(5) Were there any hazardous wastes stored on site at the time of the inspection?	✓	___	___
a. If "yes," do they appear properly packaged (if in containers) or, if in tanks, are the tanks secure?	✓	___	___
b. If not properly packaged or in secure tanks, please explain.			
c. Are containers clearly marked and labelled?	___	✓	___
d. Do any containers appear to be leaking?	___	✓	___
e. If "yes," approximately how many?			

CONTINUE ON REVERSE

(6) Has the generator submitted an annual report to EPA covering the previous calendar year?

a. How do you know?

(7) Has the generator received signed copies (from the TSD facility) of all manifests for wastes shipped off site more than 35 days ago? FACILITY HAS NOT YET SHIPPED HAZARDOUS WASTE

a. If "no," have Exception Reports been submitted to EPA covering these shipments?*

(8) General comments.

— COMPANY HAS CONDUCTED TEST OF ALL WASTE GENERATED TO SEE IF EP TOXIC OR OTHER 3 RCRA HAZARDOUS WASTE CHARACTERISTICS.

— PRESENTLY STORING WASTE FOUND TO BE EP TOXIC NEGOTIATING WITH DISPOSAL FIRM FOR TREATMENT AND DISPOSAL

— COMPANY GENERATES ABOUT 8,000 GAL/WK OF METALIC SLUDGE FROM ITS PLATING OPERATIONS. THE SLUDGE IS GENERATED AFTER TREATMENT OF PLATING OPERATION RINCES. THE COMPANY HAS CONDUCTED EP TOXICITY TESTING AND DETERMINED THE WASTE NON-HAZARDOUS. THEY HAVE APPLIED TO HAVE THE WASTE REMOVED FROM THEIR PERMIT AS A HAZARDOUS WASTE. THIS WASTE IS PRESENTLY DISPOSED OF AT SABANA GRANDE LANDFILL. A SAMPLE WAS COLLECTED FOR EP TOXICITY TESTING BY E.P.A.

*The effective date for this requirement is March 1, 1982.

CONTINUE ON REVERSE

EXHIBIT NO. 9

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10278

JAN 5 1982

Luis R. Lopez
Principal Facilities Engineer
Digital Equipment Corp.
KM L.O, Rd. 362
San German, Puerto Rico 00753

Re: Digital Equipment Corporation
EPA Identification number: PRD000706333
Facility located at : KM 1.0. RD 362, San German, Puerto Rico

Inspection performed on : September 16, 1981

Dear Sir or Madam:

The Environmental Protection Agency ("EPA") is charged with responsibility for implementing the Solid Waste Disposal Act, as amended, 42 U.S.C. §6901 et seq. ("the Act"). [Note: Among the statutes amending the Act is the Resource Conservation and Recovery Act ("RCRA"), 90 Stat. 2795, P.L. 94-580 (1976).]

In accordance with this responsibility, an inspection was performed at your facility by a duly authorized representative of the Agency pursuant to Section 3007 of the Act. On the basis of this inspection, the Director of the Enforcement Division of the EPA Region II office has determined that you have violated Section 3005 of the Act, 42 U.S.C. §6925 and the regulations promulgated thereunder, as specified by the checked boxes on the following pages.

1. By notification you informed EPA that it conducts activities at the above-referenced facility ("the facility") involving "hazardous waste," as that term is defined in Section 1004(5) of the Act, 42 U.S.C. §6904(5) and in 40 CFR §261.3. By the submittal of a Part A application pursuant to the requirements of 40 CFR Part 122, Respondent requested a permit to conduct its hazardous waste activities.

2. The above-referenced inspection revealed that your facility was being used fo the treatment, storage, or disposal of hazardous waste.

3. 40 CFR Part 265 sets interim status standards for treatment, storage and disposal facilities for hazardous wastes. These interim status standards apply until final administrative disposition of permit applications submitted by the owners of these facilities has been made. No such final disposition has been made with respect to your facility, and thus the standards of Part 265 apply to tha facility.

4. The above-referenced inspection revealed that your facility was in violation of certain provisions of the Part 265 interim status standards. The following checked paragraphs indicate the regulatory provisions that have been violated:

/ / 5. 40 CFR §265.13(b) requires that the owner or operator of a hazardous waste treatment, storage or disposal facility must develop and follow a written waste analysis plan. At the time of the above-referenced inspection, information present at your facility was insufficient to meet the requirements of this section. You were therefore in violation of 40 CFR §265.13(b).

/ / 6. 40 CFR §265.14 requires that the owner or operator of a hazardous waste facility must prevent the unknowing entry, and minimize the possibility of unauthorized entry of persons or livestock onto the active portion of the facility. At the time of the above-referenced inspection, site security at the facility was insufficient to meet all the requirements of this section. You were therefore in violation of 40 CFR §265.14.

/X/ 7. 40 CFR §265.15 requires that the owner or operator of a hazardous waste facility must develop and follow a written schedule of inspections for certain specified portions of its facility. The owner or operator must also retain a record of these inspections in a log or summary. At the time of the above-referenced inspection documents available at your facility were insufficient to meet the requirements of this section. You were therefore in violation of 40 CFR §265.15.

/ / 8. 40 CFR §265.16(d) requires that the owner or operator of a hazardous waste facility must maintain written documentation of personnel, jobs, and job-related training conducted at the facility. Documentation which existed at the facility at the time of the above-referenced inspection did not contain all of the required information. You were therefore in violation of 40 CFR §265.16(d).

/ / 9. 40 CFR §265.51 requires that the owner or operator of a hazardous waste facility must have a written contingency plan for the facility designed to minimize hazards to human health or the environment from any unplanned release of hazardous waste constituents.

/ / a. 40 CFR §265.52 describes the required contents of the plan. At the time of the above-referenced inspection, your plan did not contain all of the required elements. You were therefore in violation of 40 CFR §265.52.

/ / b. 40 CFR §265.53 requires that copies of the plan be maintained at the facility and be submitted to local police and fire departments, hospitals, and other official agencies who might be called upon in an emergency. At the time of the above-referenced inspection, copies of the plan had not been distributed in compliance with this section. You were therefore in violation of 40 CFR §265.53.

/ / c. 40 CFR §265.55 requires that a facilty employee responsible for coordinating emergency measures be either at the facility or on call at all times. At the time of the above-referenced inspection, no emergency coordinator was at the facility or on call. You were therefore in violation of 40 CFR §265.55.

/ / 10. 40 CFR §265.73 requires that the owner or operator of a hazardous waste facility must maintain an operating record at the facility containing certain required information, including a description of the type, quantity, and location of all wastes held at the facilty. At the time of the above-referenced inspection, documents available at the facility were insufficient to meet the requirements of this section. You were therefore in violation of 40 CFR §265.73.

/_/ 11. 40 CFR §265.112 requires that the owner or operator of a hazardous waste facility must develop and maintain at the facility a written closure plan which describes the steps necessary to close all or part of the facility. At the time of the above-referenced inspection, documents available at the facility were insufficien to meet the requirements of this section. You were therefore in violation of 40 CFR §265.112.

/_/ 12. 40 CFR §265.118 requires that the owner or operator of a hazardous waste facility must develop and maintain at the facility a written post-closure plan which describes the steps necessary to maintain the facility after closure. At the time of the above-referenced inspection, documents available at the facility were insufficient to meet the requirements of this section. You were therefore in violation of 40 CFR §265.118.

/_/ 13. 40 CFR §265.142 requires that the owner or operator of a hazardous waste facility must, by May 19, 1981, have at the facility a written estimate of the costs of closing the facility. At the time of the above-referenced inspection, documents available at the facility were insufficient to meet the requirements of this section. You were therefore in violation of 40 CFR §265.142.

Section 3008 of the Act authorizes the assessment of a civil penalty of up to $25,00C per day for violations of statutory provisions or relevant regulations. The determination of whether a penalty is to be imposed is based upon the nature and seriousnes of the violation and any good faith efforts to comply with the applicable requiremen It has been determined in this case that no penalty will be imposed for the violatio cited above.

It is the company's responsibility to correct all violations cited herein as expeditiously as possible. Should the cited violations be discovered at the company's facility during future inspections, it is likely that an action for the assessment of a civil penalty will be initiated. Furthermore, please be advised that this letter in no way precludes future enforcement actions for any other violations discovered as a result of this or any other inspection.

Please confirm in writing within sixty (60) days of your receipt of this letter that the above-cited violations have been corrected. This confirmation should be address to Walter E. Mugdan, Attorney, General Enforcement Branch, Enforcement Division, 26 Federal Plaza, New York, New York 10278. You must include your EPA identification number in any correspondence. Should you have any questions about this Notice or should you wish to discuss this matter further, please contact Mr. Mugdan at (212) 264-9858.

Dated: New York, New York
, 1981

JULIO MORALES-SANCHEZ
Director, Enforcement Division
U. S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, New York 10278

EXHIBIT NO. 10

August 6, 1982

SUMMARY OF FINDINGS

Digital Equipment manufactures mini-computers and circuit boards. From the manufacturing process the industry notified the following wastes:

D001 - Characteristic of ignitability

D002 - Characteristic of corrosivity

F001 - Spent halogenated solvents used in degreasing

F002 - Spent halogenated solvents (T)

F006 - Wastewater treatment sludges from electroplating process

F007 - Spent plating bath pollutions from electroplating operation

F008 - Plating bath sludges from bottom plating bath

F009 - Spent stripping and cleaning bath solution from electroplating operations

The industry, at the time of the inspection, had on-site the following wastes:

1. Chromic acid - this waste comes from the burning of the circuit boards resin. The industry generates about 25 gal. weekly. They sent this waste to be treat and re-used. For this they use manifest.

2. Cooper sulphate cristals - this waste comes from the eleaning procedure to take out the silver oxide. In normal production they generate four (4) or five (5) gallons daily. This solution is corrosive.

3. Solder oils - this waste is sold to Hydrocarbon Recovery. They generate around tea or fifteenth gallons daily. The E.P. Toxicity reveal

the lead concentration in 44.2 ppm.

Storage Area Re-inspection:

1. The industry construct an storage area. Fenced and divided to segregate the wastes. But do not have spill control system and roof.

2. They do not have any inspection log-book or internal record of - the wastes.

3. Do not have chemical segregation of the wastes. They store some raw material with the wastes.

4. At the time of the inspection they have the following quantity of wastes stored on-site:

Two-fifty five gallons drums with solder oils

Two-fifty five gallons drums with flux

Six cristal bottles (13 gallons) with chromic acid

Twenty-five (25) fifty-five (55) gallons drums with cooper sulphate

Five (5) fifty-five gallons drums with nickel to be treat on-site. The treatment consist in adjust the pH

The methalic sludge is disposed on Sabana Grande disposal

5. The containers are not property labeled

6. Some drums are opened - specific the containers with cooper sulphate

LF/sec

August 6, 1982

Mr. Carlos O'neill, P.E.
Environmental Engineer
Solid and Hazardous
Waste Area
U.S. Environmental
Protection Agency
P. O. Box 792
San Juan, Puerto Rico 00902

Dear Mr. O'neill:

We are including all the information with regard to the Full RCRA Interim Status Inspection, performed on May 11, 1982 to the Digital Equipment Corp., located in San Germán, Puerto Rico.

Please do not hesitate to contact us for any additional information.

Cordially yours,

Eng. Luis E. de la Cruz
Director
Solid, Toxic and Hazardous
Waste Area

LF/sec

EXHIBIT NO. 11

digital

de PUERTO RICO

January 23, 1986 7

HAND DELIVERED

Carlos Vazquez, Esq.
Director
Hazardous Waste Programs
Environmental Quality Board
Parque St at Pomarosa
Santurce, Puerto Rico

Re: Report on Accidental Spill

Dear Mr. Vazquez:

Attached please find our report on an accidental spillage of diesel which occurred at this plant when a one (1) inch pipeline broke down. This accident was first reported by telephone to Mr.Javier Salgado, of that Office.

Please let us know should you need additional information.

Cordially yours,

Luis A. Ureta
Environmental Manager

RECIBIDO
JUNTA DE
CALIDAD AMBIENTAL
DEC 31 1986
Area Control
Contaminación de
Terrenos

DIGITAL EQUIPMENT CORPORATION DE PUERTO RICO
P.O. BOX 106, SAN GERMAN, PUERTO RICO 00753
809 - 892-1946 TELEX 345-2038

TITLE: Report on Accidental Spill at Digital Equipment Corporation Plant at San German Puerto Rico.

General:

Digital Equipment Corporation, at San German Puerto Rico, maintains four (4) underground storage tanks for #2 fuel oil (diesel). This fuel is used to feed three steam generation units, four power generators, and a 300 gallon above ground storage tank to feed a pump used for fire sprinklers.

2. Description of the Accident:

On October 8th, 1986, at about 10:00 p.m., and during the second shift of operation, the operator in charge noticed diesel spread on the ground near the 300 gallon tank, from the pipeline going from the underground storage tank to the 300 gallon tank. The operator notified the supervisor in Facilities Engineering. Following field investigation, it was determined that the incident occurred when the one-inch pipeline going to the 300 gallon tank

broke down. Although there is continuous attendance of the area covering the process waste treatment plant, the broken pipeline was not immediately noticed until the diesel was spread over the ground on the area near the 300 gallon tank.

3. Action Taken:

The following action was taken on October 9, 1986, the day after the incident:

a. Facilities Engineering called a private contractor to work on the cleanup. The cleanup process was started on the same day.
b. The one-inch pipeline was replaced with a new one.
c. There was diesel spread on top of the ground. It was possible to recover about 5 drums of diesel, for a total of about 250 gallons.
d. Following removal of the diesel on the top of the ground, the area was cleaned by removing about 5 cubic yards of soil.
e. On October 15, 1986, the cleanup works were completed. The soil was passed to 55-gallon drums. These drums are being held on site temporarily until a proper disposal method is determined.
f. The affected area, about 250 sq. ft., was filled with topsoil and gravel.

4. Measures Taken to Prevent Further Occurrance:

The entire supply pipelines for the diesel were inspected and the deterioriated pipeline was replaced with a new one. Also, we anticipate changing the supply pipeline to above ground in the near future.

Effect on the Envir ment:

a. On Surface Waters:
There was no effect on surface waters, as the spill was contained in a small area, and did not reach any surface waters. There are no surface bodies of water near the Digital plant.

b. On Underground Waters:
The spilled diesel appears to have remained within the first two inches of soil. Therefore any diesel going below ground should have been absorbed in the 5 cubic yards of soil which was removed. We are performing further analyses to ensure that all affected soil is removed. Because of the rapid corrective action taken by Digital, it is unlikely that any underground waters were affected by this incident. (We believe that the groundwater table in the area is between 125 - 175 feet below ground.) Digital operates four deep wells at the facility. None of the wells were visibly affected. We have sent water samples out for testing, and can provide those results to you when available if you wish. There are no nearby public nor private water supplies, except for the Digital wells.

c. On Air:
We do not believe there was any adverse effect on air resulting from the accidental spill, except for a small volatilization of the diesel, which was negligible.

d. Hazardous Wastes:
The soil removed as part of the cleanup operation was impregnated with diesel. The only characteristic that would render the removed soil hazardous is Ignitability (D-002). We do not believe that the volume of fuel was enough to make the removed soil ignitable. We have sent soil samples to a qualified laboratory for analysis. We have not yet received the written report, but their oral report indicated that the soil was not ignitable.

EXHIBIT NO. 12

ESTADO LIBRE ASOCIADO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

IN RE:	CASO NUM: PRD-991291857
DIGITAL EQUIPMENT CORPORATION (San Germán, Puerto Rico)	SOBRE: ORDEN DE HACER Y DE MOSTRAR CAUSA
Querellada	REF: DL-87-004-006

ORDEN ADMINISTRATIVA

Este procedimiento administrativo es instituído en virtud de los poderes que le han sido conferidos a esta Junta de Calidad Ambiental por la Ley Número 9 del 18 de junio de 1970, según enmendada.

En tal virtud la Junta de Calidad Ambiental ha determinado que la Querellada de epígrafe, ubicada en el Km. 1.0, Carretera Número 362, San Germán, Puerto Rico, ha violado ciertas disposiciones del Reglamento para el Control de los Desperdicios Sólidos Peligrosos y No Peligrosos, que más adelante se identificarán en la Sección de esta Orden sobre VIOLACIONES y PENALIDADES.

RELACION DE HECHOS

La Querellada fue objeto de inspección por personal de esta Junta (en adelante: JCA) el día 6 de mayo de 1986. La Querellada es generadora de desperdicios peligrosos, y, tambien es catalogada como facilidad T.S.D., por almacenar, tratar o disponer de dichos desperdicios en la facilidad.

Durante la inspección se entrevistó al Ing. Angel Serrano, a la Querellada, encontrandose ciertas violaciones al Reglamento arriba indicado.

VIOLACIONES

Las violaciones surgidas por motivo de la inspección realizada a la Querellada son las que a continuación se desglosan, con las penalidades aplicables a cada una.

Regla Local	Equivalencia del C.F.R.
704-B	262.31
704-C	262.32

Como requisito previo a embarque, deberá etiquetarse y marcarse los envases conforme reglas del Departamento Federal de Transporte.

Al inspeccionarse: no se cumplía con toda la regla aplicable a etiquetas y marbetes.

812-D	265.173(b)

Deberá almacenarse cada envase de desperdicios peligrosos de modo que no cause riesgo de ruptura o de derrame.

Al inspeccionarse se encontró un envase boca abajo, causando riesgo de que se le salga su contenido.

PENALIDADES

Regla Violada	Penalidad Propuesta
704-B	$ 499.00
704-C	499.00
812-D	499.00

En virtud de los poderes conferidos a la Junta de Calidad Ambiental por la Ley Número 9, antes citada, la Junta se propone imponer multas administrativas ascendentes a la suma de Mil Cuatrocientos Noventa y Siete ($1,497.00) Dólares.

ORDEN

En vista de lo anteriormente expresado y en virtud de los poderes que le han sido conferidos a esta Junta de Calidad Ambiental, por la Ley Número 9 del 18 de junio de 1970, 12 LPRA 1121 et seq., en su Artículo 11, Incisos 14, 19 y 22 y en sus Artículos 14, 15 y 16, esta Junta ORDENA a la Querellada:

1. Corregir toda violación señalada en la presente Orden Administrativa (Reglas 704-B, 704-C, 812-D).
2. Tener disponible para inspección en sitio accesible, los planes de análisis de desperdicios (regla 807-I),

record de inspecciones (regla 803-F) y record del tipo de desperdicio generado (regla 502-A).

3. Comenzar a llevar una bitácora donde se anote todo desperdicio peligroso generado, y, el tipo de éste (regla 502-A).
4. Tomar nota de que las reglas de procedimiento civil rigen las contestaciones en estos procedimientos administrativos.
5. Mostrar Causa por lo cual no se le deba encontrar incursa en las violaciones antes señaladas, con las penalidades antes indicadas.
6. Tomar nota de que la presente Orden y subsiguiente Resolución Final no será impedimento para que la autoridad federal pertinente de los Estados Unidos de América, pueda, si así lo estima apropiado, exigir responsabilidad a la Querellada por violaciones a las leyes y reglamentos federales basados en los mismos hechos que originan la presente Orden.

Se CITA a la Querellada de epígrafe a una VISTA ADMINISTRATIVA a celebrarse en el Salón de Audiencias de esta Junta, sita en la Calle del Parque Número 204, Esquina Pumarada, Edificio Empire, Segundo Piso, Santurce, Puerto Rico, el día 6 de mayo de 1987, a las 10:00 de la mañana. Se le apercibe a la Querellada que deberá comparecer a la misma acompañada de abogado.

En adición, se le apercibe que esta Orden no podrá ser alterada, modificada o revocada a menos que un tribunal con jurisdicción, o la propia Junta, así lo ordene.

El Artículo 16 de la Ley Sobre Política Pública Ambiental (supra) faculta a la Junta de Calidad Ambiental a imponer sanciones y multas administrativas por infracciones a la ley, órdenes, reglas y reglamentos emitidos por esta Junta al amparo de la misma. Las multas administrativas no excederán de veinticinco mil ($25,000) dólares diarios por violación, entendiéndose que cada día que subsista la misma se considerará como una violación por separado. En los casos que incurra en contumacia en el incumplimiento de cualquier orden o resolución emitida por esta Junta, ésta podrá imponer una multa administrativa adicional hasta un máximo de cincuenta mil ($50,000) dólares.

NOTIFIQUESE, con copia de la Orden que antecede personalmente al Ing. Luis A. Ureta, Digital Equipment, Carretera Número 362, Km. 1.0, San Germán, Puerto Rico; y a la mano a los siguientes funcionarios de la Junta de Calidad Ambiental: Sr. Carlos Jiménez Barber, Vicepresidente; Lcdo. Carlos R. Vázquez Ayala, Miembro Asociado; Ing. Raquel Cortés, Directora Interina, Area Contaminación de Terrenos; Lcda. Norma Morales de Sánchez, Directora, Oficina Oficiales Examinadores; Lcdo. Pedro A. Maldonado Ojeda, Director, Oficina Servicios Legales y al Lcdo. Vincent Layas Arbona, Representante del Interés Público.

En San Juan, Puerto Rico, a 16 de marzo de 1987

SANTOS ROHENA, JR.
Presidente

EXHIBIT NO. 13

Report on accidental spill of concentrated Sulfuric Acid at Digital Equipment Corporation Plant at San German, Puerto Rico:

1.0 General

Digital Equipment Corporation, at San German, Puerto Rico, operates a process Waste Treatment Plant to treat wastewaters from the electroplating and metal finishing operations conducted. The treatment plant consits of a series of tanks for mixing and settling. Treatment provide consists of Ph adjustment to attain the stoichio-metric point of chemical reaction to precipitate the metallic Ions contained in the wastewaters. The Ions are mainly copper, which are precipitated in their hydroxide form. The precipitate or sludge passes to a filter press, where most of he water is removed. The treated effluent is discharged to the San German P.O.T.W.. During the Ph adjustment caustic and sulfuric Acid are used.

2.0 Description of Accident:

On Thursday 25, 1988, at about 9:30 AM, near 56 gallons of concentrated Sulfuric Acid spillaged on the floor, resulting from unbalanced action during the unloading of four drums over its pallet; the action which resulted in all four (4) drums to foll into the floor; two (2) drums were broken resulting the spillage of the acid.

3.0 Action Taken:

The following action was taken as a result of this incident:

a) spill team was activated to control the situation
b) An investigation was conducted to determine the possible causes of the incident
c) The spillage was treated with lime and the neutralized soil was collected in plastic drums for further treatment and analysis
d) soil surface samples were taken and analyzed for Ph as a control parameter to removed soil impregnated with the acid
e) see attached samples results of the area during the control of the spill.
f) phone call were placed on Feb. 25, 1988 to report the incident to EQB's RCRA and SARA groups.
g) Security coverage was provided at all times during the spill control operation.

4.0 Measures taken to prevent further occurrances:

a) chemical handling of virgin materials was limitted to three (3) drums per pallet.

b) all drums will be metal strapped prior to any transportation

c) gave special instructions to the operators in terms of loading and unloading chemical substances.

5.0 Effect on the Environmental:

a) On Surface Waters:

There was not effect on surface waters as a result of this incident the spillage was retained with the lime forming an lime embarkment. This embarkment prevented the spilled acid from reaching any surface waters.

b) On Underground Waters:

There was not effect on underground waters, since the affected area was removed immediately. Chemical testing demotrates that the area were cleaned up.

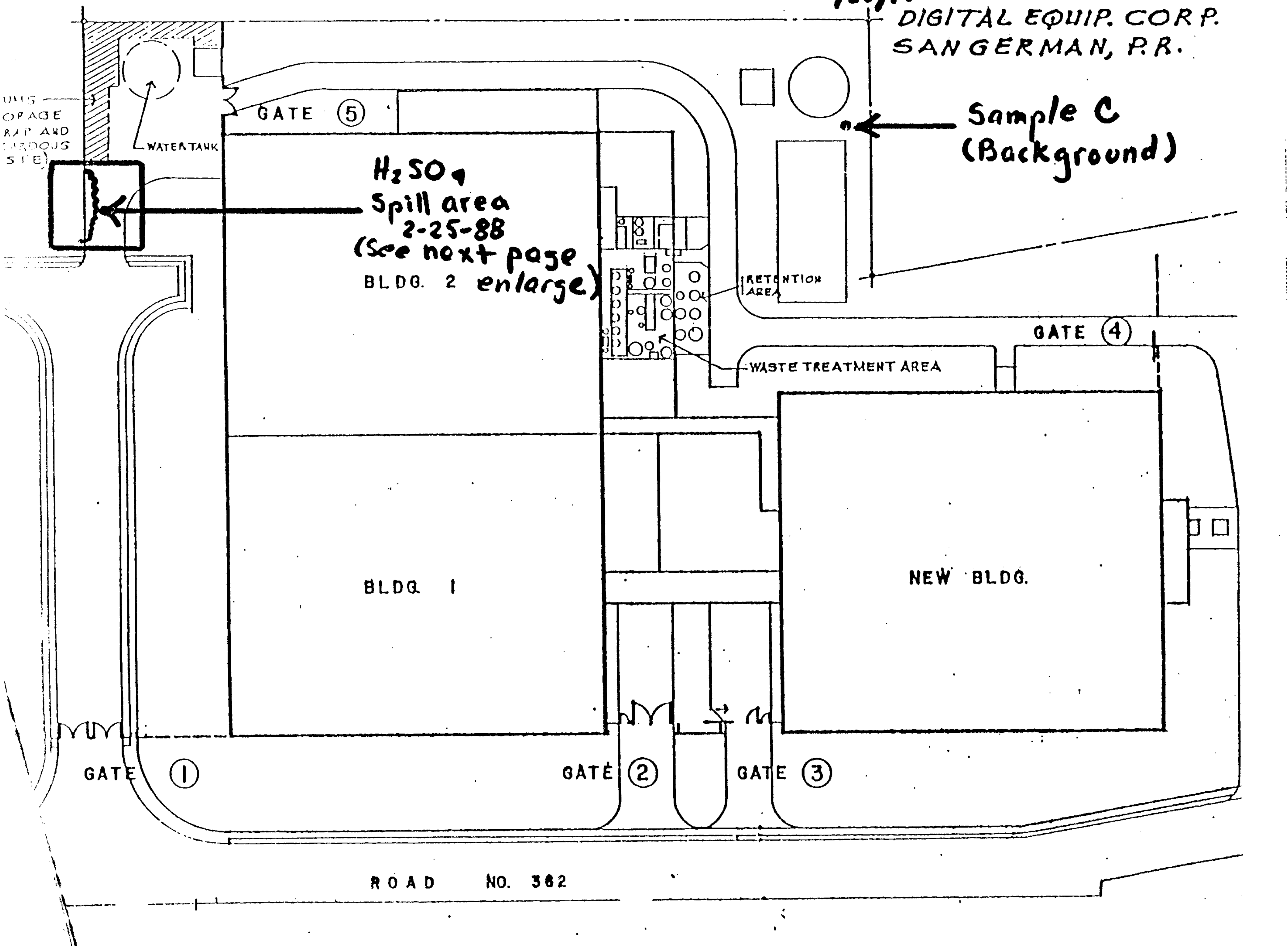
c) On the Air Environment:

There was no effect on the surrounding air as a result of this incident.

d) On Solid Waste:

There was no effect on hazardous and non-hazardous solid wates as a result of this incident. The prompt neutralization of the affected soil was enough to make it foll under the definition of non-hazardous waste.

Sulfuric Acid Incident 2/25/88



SULFURIC ACID INCIDENT
SOIL SAMPLE RESULTS
Ph

DATE	SAMPLE A 1FT	SAMPLE A 2FT	SAMPLE B 1FT	SAMPLE B 2FT	SAMPLE C (Background) 1FT	SAMPLE C (Background) 2FT	SAMPLE D
2-25-88	7.6	7.2	7.7	7.4	7.4	7.5	NO SAMPLE
2-26-88 SURFACE SOIL PRIOR TO CLEAN UP	4.25		6.30				NO SAMPLE
3-2-88 AFTER CLEAN UP	6.9		7.0				7.4

EXHIBIT NO. 14

JAN. 7 1988

Mr. Luis A. Ureta
Environmental Facility Manager
Digital Equipment Corp.
P. O. Box 10?
San German, Puerto Rico 00753

Dear Mr. Ureta:

Reference is made to your request for orientation in regard to the proper classification of circuit boards containing lead, which are generated during the manufacturing process at Digital.

According to Section 261.1 of 40 CFR, the circuit board is considered as scrap metal because of its lead content. Although the boards are not 100% lead, they are considered scrap metal based on the scrap metal definition in the Federal Register of January 4, 1985, Part II.I.A.2.

Scrap metal transported for metal reclamation is a solid waste, according to 40 CFR, Section 261.2. However, recyclable scrap metal is not subject to regulation under Parts 262 through Parts 266 or Parts 268, 270 or 124 of 40 CFR.

Since the circuit boards generated at Digital are being transported for lead reclamation, the transportation of said waste is not subject to the manifest requirements.

If you need additional information in regard to this matter, contact Mr. William O'Neill, of my staff, at 722-0437.

Cordially,

Flor L. Del Valle López

Flor Del Valle
Director
Land Pollution Control
Area

WO/sec

cc: Fernando Quiñones
Digital Equipment

Francis Torres
Goldman & Antonetti

EXHIBIT NO. 15

Junta de Calidad Ambiental

May 25, 1988

M E M O R A N D U M

TO : for Mrs. Flor L. Del Valle
Director
Land Pollution Control Area

THROUGH : Mr. Roberto Berberena, Jr.
Acting Director
Hazardous Waste Division

: Mr. William O'Neill
Acting Chief
Inspection, Monitoring and Surveillance Section

FROM : Priscilla M. Bestard
Environmental Specialist

SUBJECT : **Inspection Report for Digital Equipment, Corp. San Germán, Puerto Rico PRD 991291857**

The above mentioned company was visited on May 2, 1988. During the visit a Full RCRA Generator and TSD inspection was performed in order to determine their compliance with the Federal Resource Conservation and Recovery Act (RCRA) and the State Regulation for the Control of Hazardous and Non - Hazardous Solid Wastes (RCHNHSW).

Attached, please find the following documents in regard to this inspection:

- Inspection Form

- Notification to the company

/sec

Enclosure

SUMMARY OF FINDINGS

FACILITY DESCRIPTION AND OPERATIONS

Digital Equipment Corporation is engaged in the manufacture of circuit boards for computer devices. The process consists of electroplating with acids and bases. The metals used are: copper, lead, tin, nickel and gold.

The company has a wastewater treatment plant in which the metals are precipitated with caustic. At the end of the treatment there is a filter press to remove the liquid.

From the process the following wastes are generated:

F006 - Sludge from wastewater treatment plant. This plant receives electroplating waste waters.

D002 - Activated carbon cartridges containing metal traces

D008 - Spent filters containing lead and also spent oil contaminated with lead

F001 - 1,1,1, -Trichloroethane and methylene chloride are generated in small quantities. These solvents are used to clean metal parts (degreasing).

F003 - Spent acetone used to clean metal parts

D001 - Ignitable wastes (flux used during soldering operations and spent oil)

D002 - Corrosive solutions used during electroplating. (Copper sulfate crystals and nickel sulfate)

F007 - Potasium Cyanide containing gold traces. This waste is sent to the states for recovery.

IDENTIFY THE HAZARDOUS WASTE LOCATED ON SITE, AND ESTIMATE THE APPROXIMATE QUANTITY OF EACH. (IDENTIFY WASTE CODES):

Waste	**Waste Code**	**Quantity**
Electroplating sludge	F006	35 bags (1 yd 3/ea)
Filters	D008	32 drums (55 gal. ea)
Cooper Sulfate Crystals	D002	12 drums "

Waste	Waste Code	Quantity
Nickel Sulfate	D002	6 drums "
Waste Oil	D001	5 drums "
1,1,1,-Trichloroethane	F001	2 drums "
Flux	F003	2 drums "

PMB/sec

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS:

At the time of the inspection, it was found that Digital Equipment Corp. is in compliance with the minimum requirements of the applicable regulations.

PMB/sec

JUN. 27 1988

Mr. Luis Ureta
Environmental Eng. Manager
Digital Equipment, Corp.
P. O. Box 165
San Germán, Puerto Rico 00753

Dear Mr. Ureta:

Reference is made to the Full RCRA Generator and TSF Inspection performed at Digital Equipment Corp. in San Germán, on May 2, 1988, by personnel of the Land Pollution Control Area.

You are hereby informed that at the time of the inspection, it was found that the company is in compliance with the minimum requirements of the Regulation for the Control of Hazardous and Non - Hazardous Solid Waste, amended version.

This compliance letter is related only and exclusively with the above mentioned inspection and does not preclude from further enforcement actions.

We appreciate your cooperation.

Cordially,

for/: Flor L. del Valle López
Director
Land Pollution Control Area

FMB/scc

EXHIBIT NO. 16

REPORT ON ACCIDENTAL SPILL OF USED ETCHER SOLUTION AT DIGITAL EQUIPMENT CORPORATION AT SAN GERMAN, PUERTO RICO

1.0 General:

Digital Equipment Corporation, at San Germàn, Puerto Rico operates a process copper recovery system, which is identify as the Mecer Area; to recover copper from the used etcher solutions from the electroplating and metal finishing operation conducted. The Mecer process consists of two major steps: the separation of the Ammonia from the copper by organic extration and the recovery of the copper by electrowining cells. The ammonia is then reprocessed and the metal copper is reclaimed.

2.0 Description of Accident:

On Thursday, October 27, 1988, at about 12:30 pm, near 15 gallons of used etcher solution spillage on the sump-pit from the Mecer extraction area, resulting from a siphon process from the used etchant tank through the pump to the extraction unit and then overflowed to the mentioned sump-pit. Part of the solution overflowed from the pit to the trench system and then to the emergency pit.

3.0 Action Taken:

The following action was taken as a result of this incident:

3.1 Spill team was activated to control the situation.

3.2 An investigation was conducted to determine the possible causes of the incident.

3.3 The used etcher solution from the Pits was collected in plastic drums to further treatment in our Waste Treatment Plant.

3.4 The pit and trenches were wash down with tab water to remove all residues, then these waters were collected in the emergency pit to be transferred (pumped) to the existing batch treatment system for metal precipitation.

3.5 Spill pillows were used to absorb the etcher solution in the trench area. The spent pillows will be disposed of in accordance with the EPA/EQB rules and regulations.

3.6 Security coverage was provided at all times during the spill control operations.

3.7 The emergency pits cleaning process was concluded at 2:00 pm (Oct 27, 1988).

4.0 Measures taken to prevent further occurence:

4.1 Re-design the system to install an electric or pneumatic valve at the discharge of the pneumatic pump used to transfer used etchant to the extraction unit.

4.2 Design an install a sump-pump system for the extraction unit. This sump-pump will be capable to transfer any solution to the Mecer unit.

4.3 Gave special instructions to the Mecer unit's operators in terms of the functionality of the above-referenced measures.

5.0 Effect on the Environment:

5.1 On surface waters

There was not effect on surface waters as a result of this incident. The spillage was collected in the emergency pits and pumped to the Waste Treatment Facility.

5.2 On underground waters

There was not effect on underground waters, since the affected area is an concrete structure.

5.3 On the air

There was not effect on the sorroundings air as a result of this incident.

5.4 On solid waste

The used spill pillows will be disposed of in accordance with applicable EPA/EQB rules & regulation.

EXHIBIT NO. 17

Junta de Calidad Ambiental

16 de diciembre de 1988

M E M O R A N D O

A : Sra. Flor L. Del Valle
Directora
Area Control Contaminación de Terrenos

P/C : Sr. Carlos R. Martínez
Director Interino
Div. Desperdicios Peligrosos

: Sr. William O'Neill, Jefe Int.
Sección Inspección, Vigilancia y Monitoría

DE : Damaris Maldonado Viñas
Especialista Ambiental

ASUNTO : **Digital Equipment Corporation**
San Germán, Puerto Rico

El Sr. Luis A. Ureta, Gerente de Proyecto de la compañía mencionada en epígrafe, sometió los resultados de análisis químicos realizados a material impregnado con hidrocarburos (Diesel #2) por derrame ocurrido durante el mes de julio de 1988. El material impregnado fue removido de un tanque soterrado.

El análisis químico fue evaluado, encontrándose que los parámetros no exceden las concentraciones señaladas en la Regla 604 del Reglamento para el Control de los Desperdicios Sólidos Peligrosos y No Peligrosos, versión enmendada. Por lo tanto, el material es clasificado como no peligroso.

Luego de consultar con la División de Desperdicios No Peligrosos y luego de evaluar los análisis químicos suministrados por la compañía, recomiendo se autorice a que la compañía coordine con el Vertedero Municipal de Hormigueros o Mayaguez para que el desperdicio contaminado con el combustible sea finalmente dispuesto.

Además de los estudios antes mencionado, Digital está realizando estudios adicionales para determinar el grado de contaminación en el área afectada. Los resultados obtenidos serán evaluados tan pronto sean sometidos con el fin de determinar si se necesitan actividades de limpieza adicionales.

/sec

19 de diciembre de 1988

Sr. Luis A. Ureta
Gerente de Proyecto
Digital Equipment Corp.
de Puerto Rico
P. O. Box 106
San Germán, Puerto Rico 00753

Estimado señor Ureta:

Hacemos referencia a su solicitud para disponer de material contaminado con hidrocarburos (diesel #2).

Deseamos informarle que el Area Control Contaminación de Terrenos, no tiene objeción a que el desperdicio sea dispuesto en el Vertedero Municipal de Hormigueros o Mayagüez, siempre y cuando se utilice el sistema de relleno sanitario y se cumpla con los requisitos aplicables del Reglamento para el Control de los Desperdicios Sólidos Peligrosos y No - Peligrosos.

Luego de concluir con la actividad de disposición, deberá someter una certificación de que la misma se ha llevado a cabo según requerida por nuestra Agencia.

De necesitar información adicional al respecto, favor comunicarse con la Srta. Damaris Maldonado, llamando al teléfono 725-5140 ext. 302.

Cordialmente,

Flor L. Del Valle López

Flor L. Del Valle López
Directora
Area Control Contaminación
de Terrenos

DMV/sec

digital
de PUERTO RICO

September 30, 1988

Mr. William O'Neill Cardona
Acting Chief
Inspection, Monitoring and
Surveillance Section
P.O. Box 11488
Santurce, Puerto Rico 00910

RE: Impregnated soil with fuel from underground tanks area, at Digital Equipment Corporation plant at San German, P.R.

Dear Mr. O'Neill:

Digital Equipment Corporation at San Germån is submitting the E.P. Toxicity Tests results of the soil impregnated with traces of Diesel #2. The laboratory results indicates that the soil is not hazardous.

Also, as part of the action plan submitted to you, the soil was mechanically areated to evaporate the hydrocarbon impregnated in the soil for a period of time. The levels of Total Hydrocarbons (<50 ppm) are in the range that will not affect the environment. We are including a test result which indicates a low concentration.

Based on the enclosed facts, Digital Equipment Corporation will proceed to dispose the soil as non-hazardous waste to be used as top-soil in an approved sanitary landfill.

Should any question arises during the review of this report, please contact the undersigned for details.

Cordially,

Luis A. Ureta
Env. Facilities Manager

LU/mcv

cc: Ms. Damaris Maldonado-EQB
Mr. Luis Rodriguez-EQB
Mr. Fernando Quiñones-DEC
Mr. Jorge Rodriguez-DEC
Mr. Miguel Nazario-DEC
Mr. Hernando Echavez-DEC
Mr. Stephen Greene-DEC
Mr. Pedro Lôpez-DEC
Mr. Jorge Arrufat-Caribe Hydroblasting

EXHIBIT NO. 18

digital
de PUERTO RICO

May 3, 1989

William O'Neil
Environmental Quality Board
P.O. Box 11488
Santurce, Puerto Rico 00910

RE: REPORT OF ACCIDENTAL SPILLAGE OF SULFURIC ACID

Dear Mr. O'Neil:

The attached report describe an incident wich occurred on May 1, 1989; resulting a spill of Sulfuric Acid Technical grade at the Digital's Building #6 stock room 186 area of this facility.

Following occurence of the spill, immediate corrective steps were taken to prevent any damage to the environment as explained in the attached report. The spill was reported by telephone on May 1, 1989 at this agency, as well as to:

- Police Department - Mayaguez explosive division section

Please, let me know should you need additional information in regards to this incident.

Sincerely,

A. Serrano

Angel Serrano

cc: Pedro Lopez
Jorge Rodriguez
Miguel Nazario

AS/dlr

DIGITAL EQUIPMENT CORPORATION DE PUERTO RICO
P.O. BOX 106, SAN GERMAN, PUERTO RICO 00753
809 - 892-1946 TELEX 345-2038

SPILL/MATERIAL/HAZARDOUS INCIDENT REPORT

Building Number: Digital #6

Location: Complejo Industrial El Retiro , San German, Puerto Rico 00753

EPA ID #: PRD991291857

Plant Manager: Miguel Nazario

Name of Person Reporting Incident: Angel Serrano

****

Reportable Quantities only

Agency (ies) Contacted:
Environmental Quality Board
Police Department - Mayaguez

Person (s) Contacted:
Ms Damaris Maldonado - EQB
Mr. Jorge Rosas - Police

Date Report Mailed:
May 3, 1989

****

Date, Time and Location of Incident:
Date: May 1, 1989 Time: 10:42 A.M. Location: Digital BLDG#6 Stock Room 186

Material Description, Hazard Class, UN Number: 1830
Sulfuric Acid Technical Grade , Corrosive Liquid

Quantity of Material Involved (lbs, gals, etc.):
Total Qty: 55 gals

Extent of Contamination (Area): Stock Room 186 Only (Floor)
Non-Ambient Contamination Impact

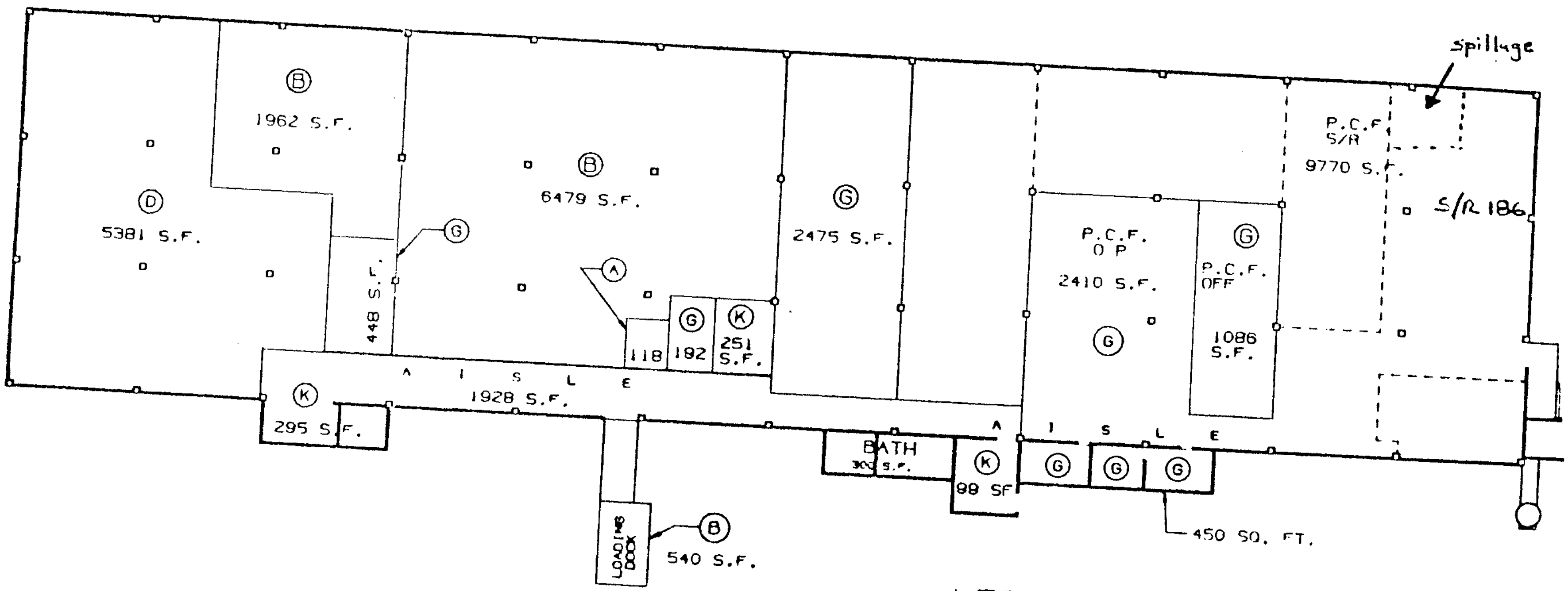
Description of Incident: Finger Lifter operator handling one pallet with Two(2) drums contain Sulfuric Acid Technical grade tilt over causing the lift of one drum to come open such tilt was caused to the drums getting caught on the top of rack.

Preventive and Corrective Actions: Corrective Action: Digital's Spill Team was activated and immediately controlled the spillage material with acid neutralizer and lime. Diked with spill control pillows. Collected into two(2) drums(plastic) and finally treated in the waste water treatment plant Batch Treatment process.

Preventive Action: Install plates underneath each one of the rack frames so it could become a smooth surface.

Distribution of Report:
Plant Manager
Division Manager
Production/Manufacturing Mgr.
Environmental Programs Dept.

A Serrano
Signature of person reporting the incident



BLDG.6 ACTUAL SPACE

LEGEND

A	PERSONNEL	G	P.C.F.
B	MAC	H	ADMINISTRATION
C	I.S.	I	CUSTOMER REPAIR
D	ENG./QUALITY	J	EXCESS SPACE
E	PRODUCT SUPPORT ENG.	K	COMMON AREA
F	MANUFACTURING	L	FINANCE

BLDG-6.PRT L-5

AUG 88

EXHIBIT NO. 19

May 10, 1989

Mr. William O'Neill Cardona
Acting Chief
Inspection, Monitoring
and Surveillance
P.O. Box 11488
Santurce, Puerto Rico 00910

RE: <u>Remedial Action Plan for the SGO's Underground Tank Area at Digital Equipment Corporation.</u>

Dear Mr. O'Neill:

Please find enclosed the remedial plan to be implemented at the San Germán - DEC Plant where the underground diesel fuel storage tanks were located. These plan is generated as part of the Phase I's results, where we performed soil borings and monitoring well installation to cover the sub surface investigation program.

The test results of the Geo-Study indicate that there was not lateral extend of Petroleum Hydrocarbons contamination in the soil, also underground water at the inmediate vecinity of the affected area where the tanks were located was not affected.

Based on the above circunstances, Digital Equipment Corporation, San Germán Plant will proceed to:

* Remove/clean up the residual soil impregnated with fuel.

* Lower the total hydrocarbons concentration from the removed impregnated soil.

* Handling, transportation & disposal of the soil in accordance with the local/state requirements to manage non-hazardous wastes.

* Compactation & installation of the above ground tanks.

* Digital's certification on the execution of the above activities.

We just received the Geotechnical report that presents our results and conclusions of Phase I Subsurface investigation of the storage tank area.

We are in the process to send a copy of this report to Mr. Nêstor Rivera for his evaluation and records.

Please review the report and call us if any further information is needed.

Cordially,

Pedro Lôpez
Environmental/PME Manager

cc: Damaris Maldonado - EQB
Nestor Rivera - EQB
Luis Ureta - DEC
Jorge Rodriguez - DEC
Luis R. Lôpez - DEC
Hernando Echavez - DEC
Stephen Greene - DEC
Miguel Nazario - DEC

Title: Remedial Action Plan for the SGO's Underground Tank Area at Digital Equipment Corporation

1.0 Introduction:

The purpose of this remedial plan is the outline a program by which a clean closure of the Digital Equipment Corporation's underground storage tank area can be accomplished. This document addresses the tasks to be performed during the clean up process of the area and identifies the party or parties accountable for each task. A project schedule and cost estimates are provided as part of this remedial plan.

No monitoring program is included as part of this document, since the Geothecnical Assestment showed no migration to the groundwater, and to the inmediate vertical & horizontal vecinity where the tanks were located.

Excavation of the residual impregnated soil with fuel will be minimal since the bebrock in the area is between 35 ft-40 ft deep.

2.0 Site Description:

The site is situated inside Digital, San Germàn Plant in San Germàn, Puerto Rico. The plant occupies approximately 15 acres (6.2 hectares) along state Road No. 362. Site locus is illustrated on figure #1, building No. 2, houses the Board Shop (an area of the Printed Circuit Facility). Review of site topography reveals a total relief of approximately 18 ft (5.5 m), sloping in a general southwest direction from about elevation 342 to elevation 324.

The area were the underground tanks were located is about 45 ft by 35 ft and it is next to the W/T area in building No. 2.

3.0 Sub-Surface Studies:

Studies were conducted at the area to identify the lateral extent of a possible contaminant fume. Five (5) shallow wells were drilled as soil test borings in the inmediate vecinity where the tanks were located. Within an approximate 100 ft. radius of the underground tank area. The borings were performed by Goe-Tech and were observed on a full-time basis by a representative of GZA. Boring locations were identified in the field by GZA and subsequently established in plan and elevation by Geotech using survey measurement during Nov/88. Three (3) bore holes were advanced in the water-saturated soil above bedrock. Two (2) borings were advanced into the bedrock. All bore holes were advanced through the soil overburden using hollow-stern auger techniques and through bedrock by rotary drilling with a double-tube core barrel and diamond bit. Standard 2-inch D.D. split-spoon samples were taken at 5-foot intervals or at detected charges in soil strata.

Upon completion of boreholes, the anular space between the borehole and screen was backfilled with Silica filter sand as the augers were retracted. The volume of backfilled sand was monitored to ensure that the sand pack extends the full length of the screen. Compacted bentonite clay seals was constructed above the surface water infiltration into the anular space. Upon completion, each well were protected with a cast iron curb box with lacking cap set flush with the ground surface. Borings locations, as illustrated in figure 2, were identified in the field by GZA and subsequently determined in plan and elevation by Geotech during the Nov/88, using survey measurements.

4.0 Remedial Plan Operation:

The following sections describes the remedial plan operations and responsibilities for work at the site. DEC will maintain charge of the site during all site activities. A GZA representative will be present to observe site activities, provide general oversight on be half of DEC, and collect soil samples for subsequent laboratory analysis. The Remedial Action Contractor (R.A.C.) will be responsible for excavation, transportation (handling, loading & unloading), mechanical aeration of impregnate soil, compactation, and disposition of the soil and sand removed from the area. The Remedial Action Contractor will report directly to DEC.

DEC will maintain 24-hour security at the site during removal operations as part of the day-to-day surveillance program.

Personnel involved in the remedial plan operations will include the following:

* Project Manager	Luis Ureta (DEC)
* Hazardous & Non-Hazardous Waste Coordinator	Angel Serrano (DEC)
* Emergency Coordinator	Carlos Rivera
* Independent Registered professional Engineer	
* Observation services and soil screening	Upon selection:
* Technicians and equipment operators.	

4.1 Movilization:

Remedial plan operation will be initiated with the movilization of the Remedial Action Contractor. All personnel and equipment operators supplied by the R.A.C. are trained in accordance with OSHA's regulations for non-hazardous waste operations and emergency response (29 CFR 1910.120) and any other applicable federal and local laws. In addition, all site activities will be carried out in accordance with the site-specific Health and Safety Plan (HASP) which is attached as appendix "A".

Personnel and equipment needs to be supplied by the R.A.C. will include, at a minimum, the following:

1 Backhole (case 580 or equivalent W/operator)

1 Digger (w/operator)

1 Water truck & pump (1000 galoon minimum with driver)

1 Gasoline or diesel powered electrical generator (110/220 VAC, 15 KW).

1 Lighting System

1 Truck (4 yards capacity-open truck with driver).

1 Site supervisor

8 Laborers

1 Compactor machine

Tools for perform manual clean up

Prior to commencement of removal activities the R.A.C. will set up a support zone adjacent to tank farm area. The support zone will contain the following:

* An awning to provide protection from the sun.
* A first aid station (including oxigen).
* Drinking water.

A personnel/equipment decontamination area will be established at the point of exit from the site. The decontamination area will provide facilities for washing the tires, treads, buckets or other part of equipment and hand tools which may become impregnated during the course of the remedial plan operations. Personnel decontamination facilities will include an area for personnel to remove, store, decontaminate or dispose of affected clothing proir to leaving the area. Additional facilities for personnel to wash their hands and face will be provided.

4.2 Removal of Impregnated Soil and Backfilled Sand river:

The removal process will commence in the area by excavating the sand river at about 250 tons, this material will be transferred to the existing parking lot. Due to the distinctive color of the soil W/fuel, a visual criterion will be used to remove the residual impregnated material from the site. Also, this material will be transported to the parking lot for mechanical areation. Residual soil will be collected using light equipment and hand tools as appropriate; these will be specifically used for the thin areas. The loose material will be placed in the open tank truck containers to be transferred to the parking lot. As material is gathered it will be placed and spreaded in the parking lot area, the contaminated soil will be kept separately from the uncontaminated sand, so the residual part can be treated (Hydrocarbon evaporation by mechanical aeration) separately, then both materials will be disposed of as top soil following all local/federal requirements to manage non-hazardous waste.

4.3 Analysis of Soils Remaining on-Site:

Once the removal of the sand and residual soil impregnated with fuel has been completed; as previously discussed, the decision to remove the soil from the site will be based initially upon visual appearance. To corroborate the effectiveness of the visual method, samples of the soil to be left on-site will be collected by R.A.C. for laboratory analysis for total hydrocarbons concentrations. There is no action levels established for this case, since the material impregnated with diesel is a non-regulated waste.

Analysis will be performed on samples taken throughout the excavation area; a total of a 5 samples will be taken, from the bottom and from the four sides of the excavation. Each sample will be a composite one and will be submitted for laboratory analysis for total hydrocarbons. Soil sampling, chain of custody and analitical procedures will be carried out in accordance with the standards requirements established by EPA/EQB.

4.4 Mechanical Aeration and Final Disposition of the Residual Soil:

The removed residual soil will be mechanically aerated to lower the total hydrocarbons concentrations to less than 100 ppm.

Qualified contractor to handle, transport and dispose of accordingly will be used as to meet local requirements to handle, transport and dispose of non-hazardous waste.

Sampling & laboratory analysis will be executed to certified adecuate concentration on the soil to be disposed as top soil.

5.0 Final Report and Photo Documentation:

Starting with the initial movilization and throughout the course of removal operations, mechanical aeration and final disposition, a daily log will be maintained by Digital describing site activities. Each daily log will include, but not necessarily be limited to the following:

1. Date, weather conditions, and name of the report preparer.

2. Equipment used during on-site activities.

3. Quantities of material staged at and/or transported from the site to the DEC-parking lot.

4. Nature and extend of work performed during the day.

5. Soil screening results and samples collected.

6. Summary of R.A.C. Services.

7. Summary of discussions which may arise regarding changes in the removal operations or health and safety requirements.

8. List of visitors to the site and purpose of visit.

9. Deviations from the originally proposed plan.

In addition to the daily log, DEC will develop photo-documentation of site activities from initial movilization through completion of removal activities.

A licensed professional engineer from Puerto Rico, will visit the site during each phase of work to evaluate the effectiveness of the remedial plan. He will produce a field report describing his observations and recommendations made while at the site.

6.0 Compactation of Excavated Area:

The area will be compacted in accordance with the Civil Engineering standards considering the structure to be placed above the site.

7.0 Certification of the Executed Remedial Plan:

Upon completion of the remedial plan operations, a final site inspection will be conducted by the licensed engineer. Based upon this inspection and satisfactory completion of the remedial action plan discussed before, the engineer will provide certification of the activities performed as described.

8.0 Notification and Operation Schedule:

Submission of this remedial action plan to EQB represents formal notification of this task. Upon receipt of satisfactory review from EQB, preparation for movilization will proceed simultaneously with in accordance with the plan. Once operations are under way, it is estimated the forty working days will be required to complete the tasks described.

9.0 Cost Estimates:

The estimated cost for the remedial action plan for this work at the San Germán Facility is $100,000.00 which include a 15% contingency factor. This estimate includes costs for equipment, personnel, waste transportation, sampling & analitical work, compactation, professional services and waste disposal.

A cost breakdown is provided below:

Item	Estimated Cost
* Removal & transportation to the parking lot	$ 25,000
* Compactation of the excavated area	30,000
* Mechanical aeration & transportation for land disposal	20,000
* Laboratory Analysis	2,000
* Observation and Support Services	4,000
* Registered professional Eng.	6,000
Sub-total:	87,000
15% Contingency	13,000
Total:	$ 100,000

DIGITAL'S RFA INSPECTION REPORT

ATTACHMENT 1:

COPIES OF AIR EMISSIONS PERMITS

DIGITAL'S RFA INSPECTION REPORT

ATTACHMENT 2:

PHOTOS FROM SOLID WASTE MANAGEMENT UNITS (SWMU'S)

AND AREAS OF CONCERN (AOC)

EXHIBIT NO. 20

digital de PUERTO RICO

May 25, 1989

Mr. William O'Neill Cardona
Acting Chief
Inspection, Monitoring and
Surveillance Section
P.O. Box 11488
Santurce, Puerto Rico 00910

RE: REMEDIAL ACTION PLAN FOR SGO'S UNDERGROUND TANK AREA AT DIGITAL EQUIPMENT CORPORATION

Dear Mr. O'Neill:

Reference is made to our telephone conversation on May 18, 1989, where we concluded in the following agreements:

1. The residual concentration of total hydrocarbon in the soil will be minimal and based on the results of the DEC soil sampling and analysis program of July, 1988 do not indicate the presence of free product at 24 feet deep. Rather, these low concentrations of PHCS probably represents dissolved contaminants within the soil water in the unsaturated soil as explained in the Final Report, page numbers 14 and 15.

Digital will perform chemical analysis of the residual soil for total hydrocarbon, results will be incorporated in the final report, any excessive concentration will be reported to EQB immediately for prompt discussion.

2. Digital will submit a copy of the final report to EQB during this week.

3. DEC will notify EQB/Air quality division on our intention to perform mechanical areation of the impregnanted soil with diessel.

4. EQB will approved in writting our petition to implement this remedial plan, as soon the report is submitted to EQB.

Also, we want to emphasize that we already selected the remedial action contractor, to perform the remedial plan at the Digital facility. We expect to initiate the movilization on Friday 26, 1989 to start with the removal on Monday 29, 1989; and complete it by June 16, 1989.

DIGITAL EQUIPMENT CORPORATION DE PUERTO RICO
P.O. BOX 106, SAN GERMAN, PUERTO RICO 00753
809 - 892-1946 TELEX 345-2038

We appreciate your continuous support in this important remedial plan and we will maintain you inform in our progress.

Sincerely Yours,

Pedro Lopez

Ing. Pedro Lopez
Plant Maint/Eng. Manager

PL/dlr

cc: Stephen Greene - DEC
Luis A. Ureta - DEC
Jorge Rodriguez - DEC
Jeanette Escabi - DEC

EXHIBIT NO. 21

157

November 20, 1989

Ms. Flor del Valle, Director
Land Pollution Control Area
Environmental Quality Board
P.O. Box 11488
Santurce, Puerto Rico 00910

RE: Digital Equipment Corporation
San Germán, Puerto Rico
Part A of RCRA and Additional Information
for the Closure Plan

Dear Ms. del Valle:

On October 9, 1989, Digital Equipment Corporation re-submit the Closure Plan (CP) for the Container Storage Area.

As part of your NOD of August 21, 1989, DEC agreed with Mr. Nestor M. Rivera's recommendation to modified the application for Hazardous Waste Permit (Part A of RCRA). You will find this form attached to this letter, fully completely and signed by DEC officials.

Regarding the Closure Plan (CP) for the Container Storage Area, DEC is submitting the following additional information:

- MSDS for Ammonia
- Engineer Certification (40 hrs. of Health and Safety Training)

If you have a question, contact me at 892-1946 Ext. 2574 or Mr. José J. Rivera from PP&A at 384-2747.

Cordially yours,

Angel Serrano
Environmental Engineer

/mcv

cc: Mr. Nestor Rivera (EQB)
Mr. Samuel Berrios (EQB)
Mr. Douglas Pocze (EPA)
Mr. José J. Rivera (PP&A)
Mr. Pedro J. Panzardi (PP&A)
Mr. Américo Abadía (DEC)

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting)

FP R D 9 9 1 2 9 1 8 5 7 | D

GENERAL | LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill—in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill—in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold—faced terms.**

SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)		X	
C. Is this a facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)	X			F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X		J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP D I G I T A L E Q U I P M E N T C O R P O R A T I O N

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 SERRANO ANGEL ENV. ENG.	809 892 1946

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 PO BOX 106

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 SAN GERMAN	PR	00753

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 KM. 1.0 PR ROAD 362

B. COUNTY NAME

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 SAN GERMAN	PR	00753	

CONTINUED FROM THE FRONT

II. SIC CODES (4-digit, in order of priority)

A. FIRST		B. SECOND	
3471	(specify) Electroplating, Plating	7 3575	(specify) Computer terminals
C. THIRD		**D. FOURTH**	
	(specify)	7	(specify)

III. OPERATOR INFORMATION

A. NAME: DIGITAL EQUIPMENT CORPORATION

B. Is the name listed in Item VIII-A also the owner? [X] YES [ ] NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)

P (specify)

D. PHONE (area code & no.): A 617 897 5111

E. STREET OR P.O. BOX: 146 MAIN STREET

F. CITY OR TOWN	G. STATE	H. ZIP CODE
MAYNARD	MA	01754

IX. INDIAN LAND

Is the facility located on Indian lands? [ ] YES [X] NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)	D. PSD (Air Emissions from Proposed Sources)	
9 N N/A	9 P PFE-6 4-0485-I II-0	
B. UIC (Underground Injection of Fluids)	**E. OTHER (specify)**	
9 U 84-0018	9	(specify) PRASA PERMIT
C. RCRA (Hazardous Wastes)	**E. OTHER (specify)**	
9 R PRD991291857	9	(specify)

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

Manufacture of printed wiring boards for computers and assembly of computer terminals.

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Miguel Nazario		10/27/89

COMMENTS FOR OFFICIAL USE ONLY

C

Please print or type in the unshaded areas only (fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-S80004

3 RCRA

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER: F PRD 9 9 1 2 9 1 8 5 7 1

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

☒ 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

☐ 2. NEW FACILITY *(Complete item below.)*

C	YR.	MO.	DAY	
8	68	07	11	FOR EXISTING FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

YR.	MO.	DAY	
			FOR NEW FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

☒ 1. FACILITY HAS INTERIM STATUS

☐ 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES — CODES AND DESIGN CAPACITIES

A. PROCESS CODE — Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY — For each code entered in column A enter the capacity of the process.

1. AMOUNT — Enter the amount.
2. UNIT OF MEASURE — For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PRO-CESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PRO-CESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C | DUP | T/A | C: 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	S 0 1	9,870	G		7				
2	S 0 1	1,650*	G		8				
3	S 0 1	25 **	M		9				
4					10				

*(30 drums of 55 gals. each) ** M - metric tons

...ESSES (continued)

SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

V. DESCRIPTION OF HAZARDOUS WASTES

. EPA HAZARDOUS WASTE NUMBER — Enter the four—digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four—digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

. **ESTIMATED ANNUAL QUANTITY** — For each **listed waste** entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each **characteristic or toxic contaminant** entered in column A estimate the total annual quantity of all the non—listed waste*(s)* that will be handled which possess that characteristic or contaminant.

. **UNIT OF MEASURE** — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

). **PROCESSES**

1. PROCESS CODES:
   For listed hazardous waste: For each **listed** hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non—listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate **all** the processes that will be used to store, treat, and/or dispose of all the non—listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.
2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

IOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by nore than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

:XAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non—listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated :00 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3	D 8 0			
	D 0 0 2	400	P	T 0 3	D 8 0			
X-3	D 0 0 1	100	P	T 0 3	D 8 0			
X-4	D 0 0 2							included with above

CONTINUE ON PAGE 3

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1): W P R D 9 9 1 2 9 1 8 5 7 — T/A C: 1

FOR OFFICIAL USE ONLY: W DUP — T/A C: 2 — DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	F001	3.4	M	S01	
2	F003	1.4	M	S01	
3	F006	669.8	M	S01	
4	D001	2.8	M	S01	
5	D002	35.25	M	S01	
6	D008	15.7	M	S01	
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

EPA Form 3510-3 (6-80)

(enter "A", "B", "C", etc. behind the "3" to identify photocopied pages)

CONTINUE ON REVERSE

...ne front.

...SCRIPTION OF HAZARDOUS WASTES *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

EPA I.D. NO. *(enter from page 1)*

F P R D 9 9 1 2 9 1 8 5 7 – 6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground—level)* that clearly delineate all existing structures; existing storage, ...atment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail).*

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
18 05 30	67 02 18

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
E Digital Equipment Corporation	617-897-5111

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F 146 Main Street	G Maynard	MA	01754

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Miguel Nazario		10/27/89

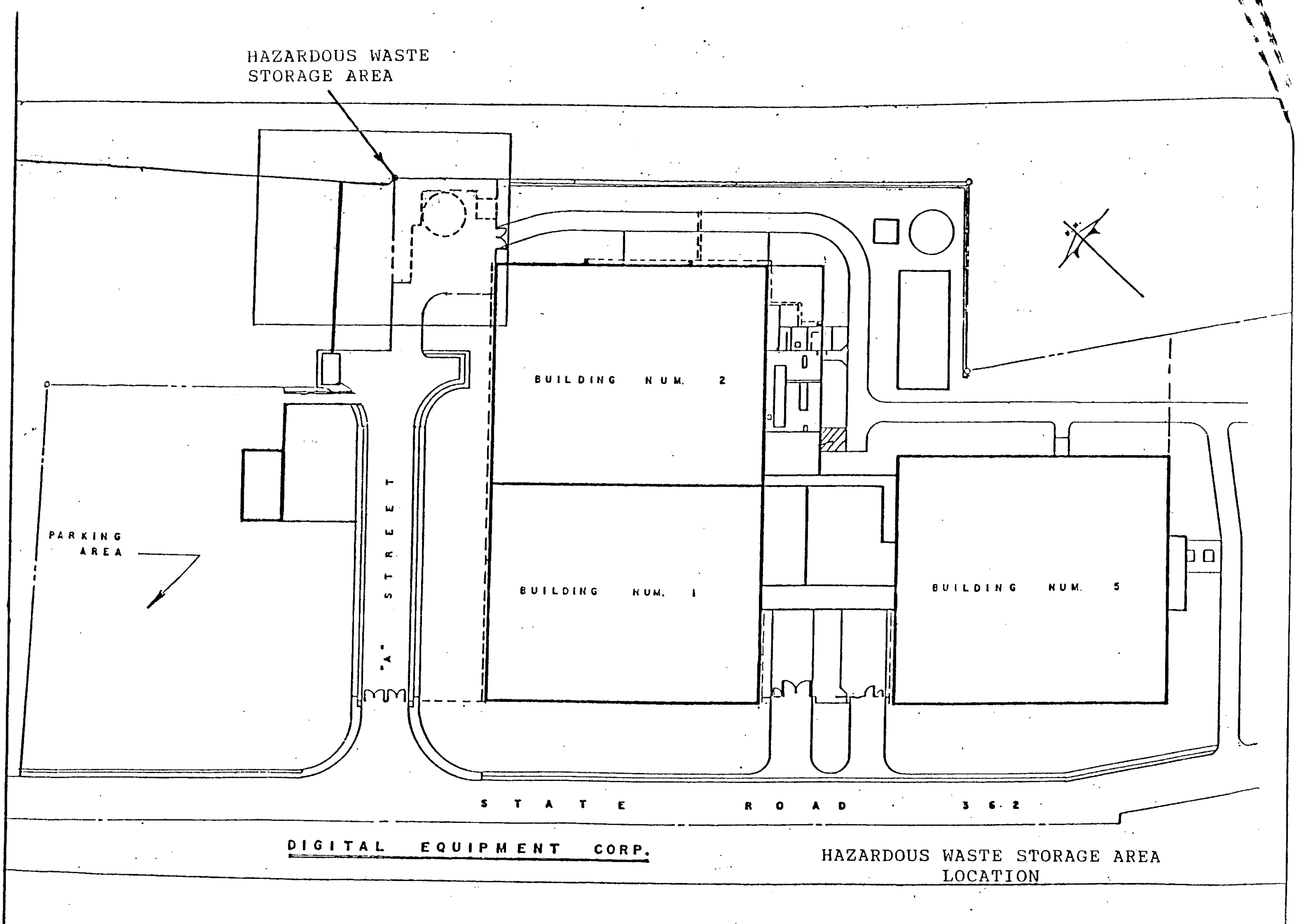
X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Americo Abadia		10/27/89

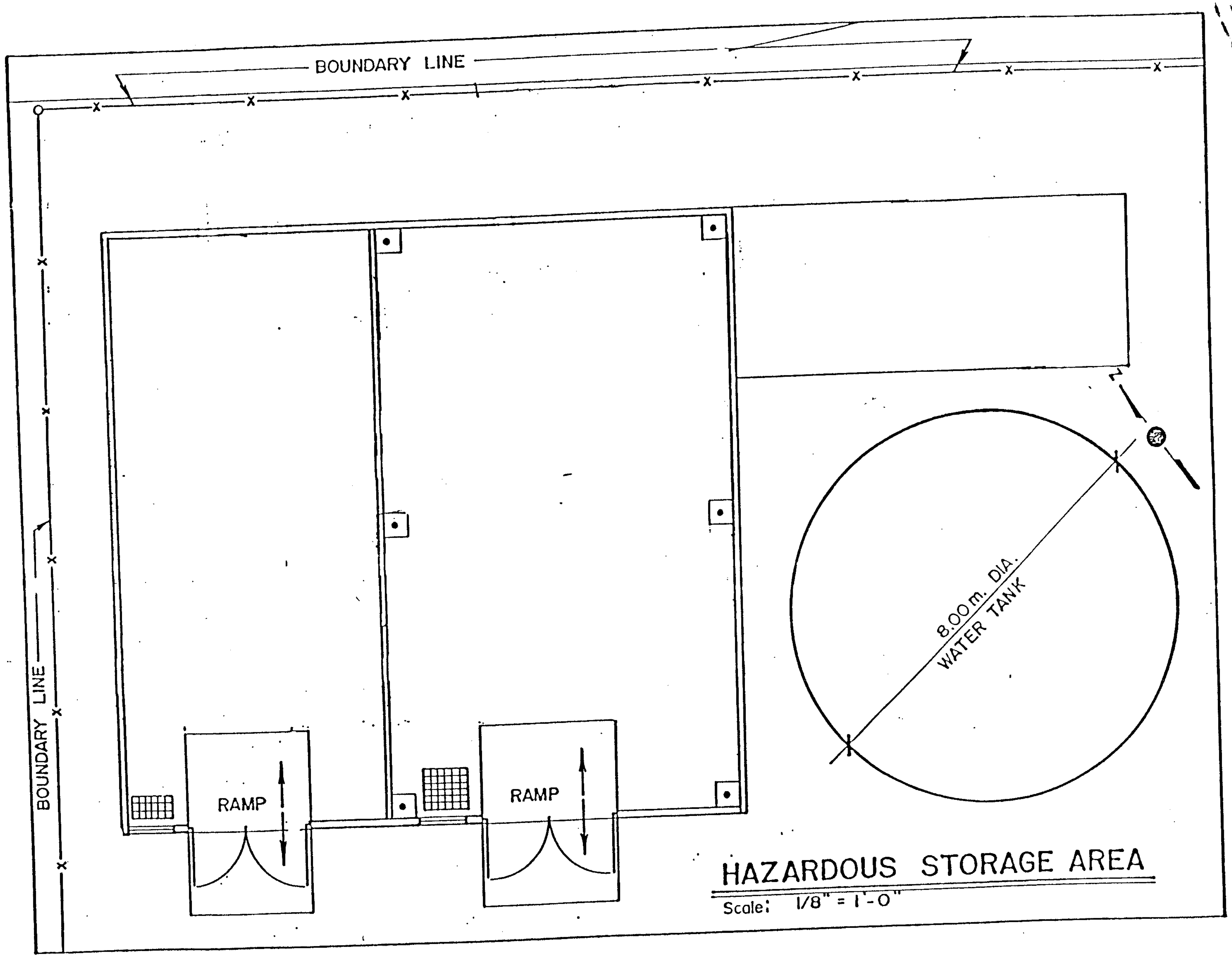
CONTINUE ON PAGE 5

...CILITY DRAWING (see page 4)



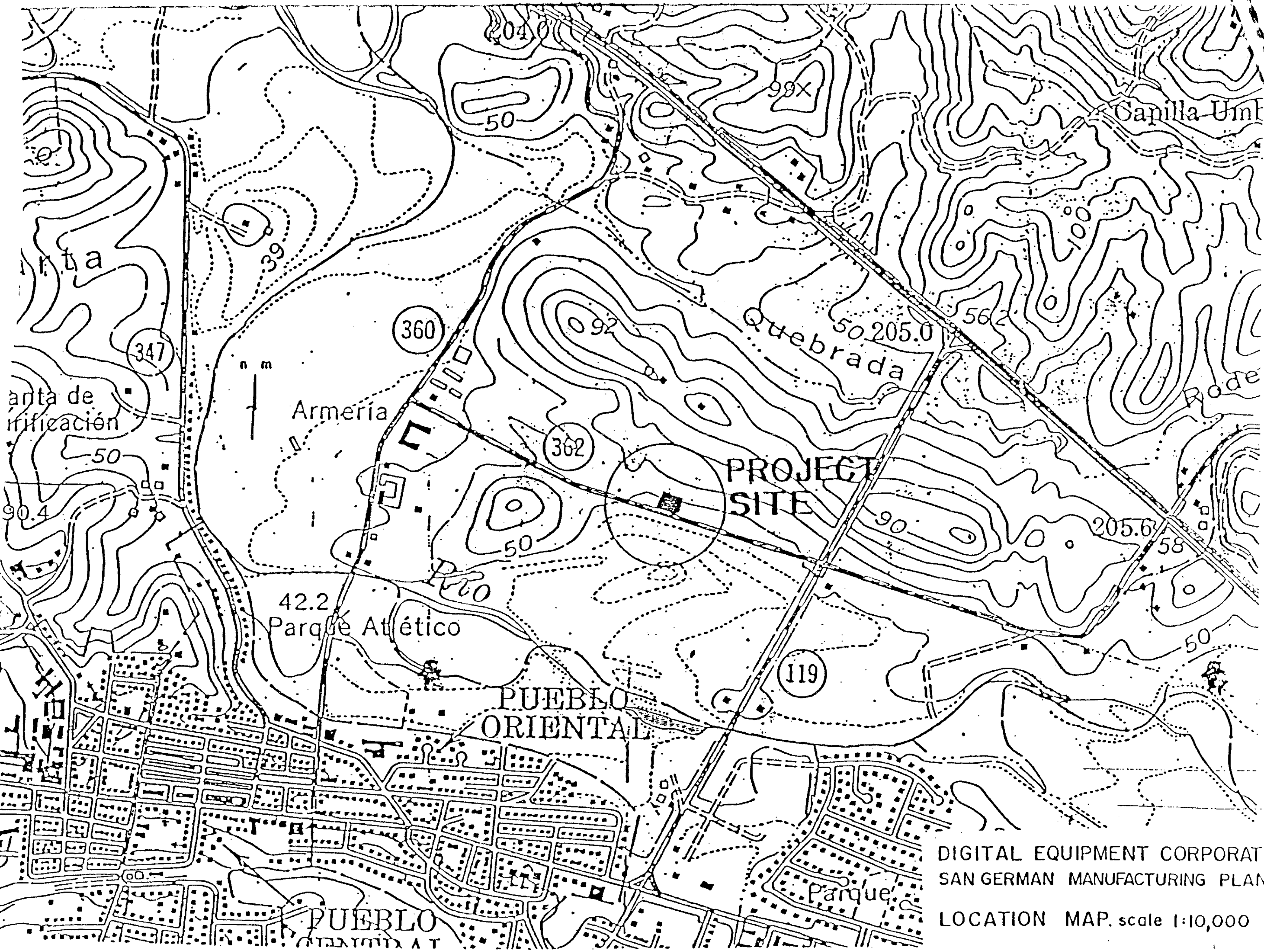
HAZARDOUS WASTE
STORAGE AREA
BUILDING NUM. 2
BUILDING NUM. 1
BUILDING NUM. 5
PARKING
AREA
"A" STREET
STATE ROAD 362
DIGITAL EQUIPMENT CORP.
HAZARDOUS WASTE STORAGE AREA
LOCATION

FIG. 1



HAZARDOUS STORAGE AREA

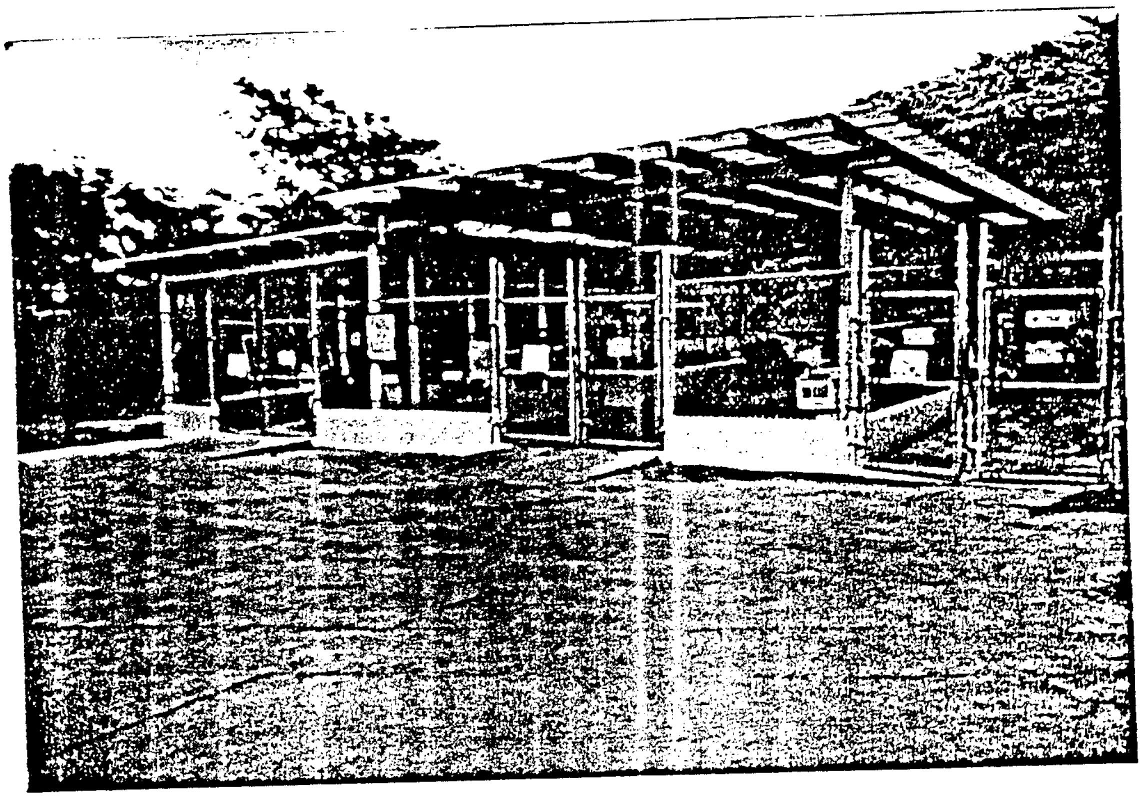
Scale: 1/8" = 1'-0"

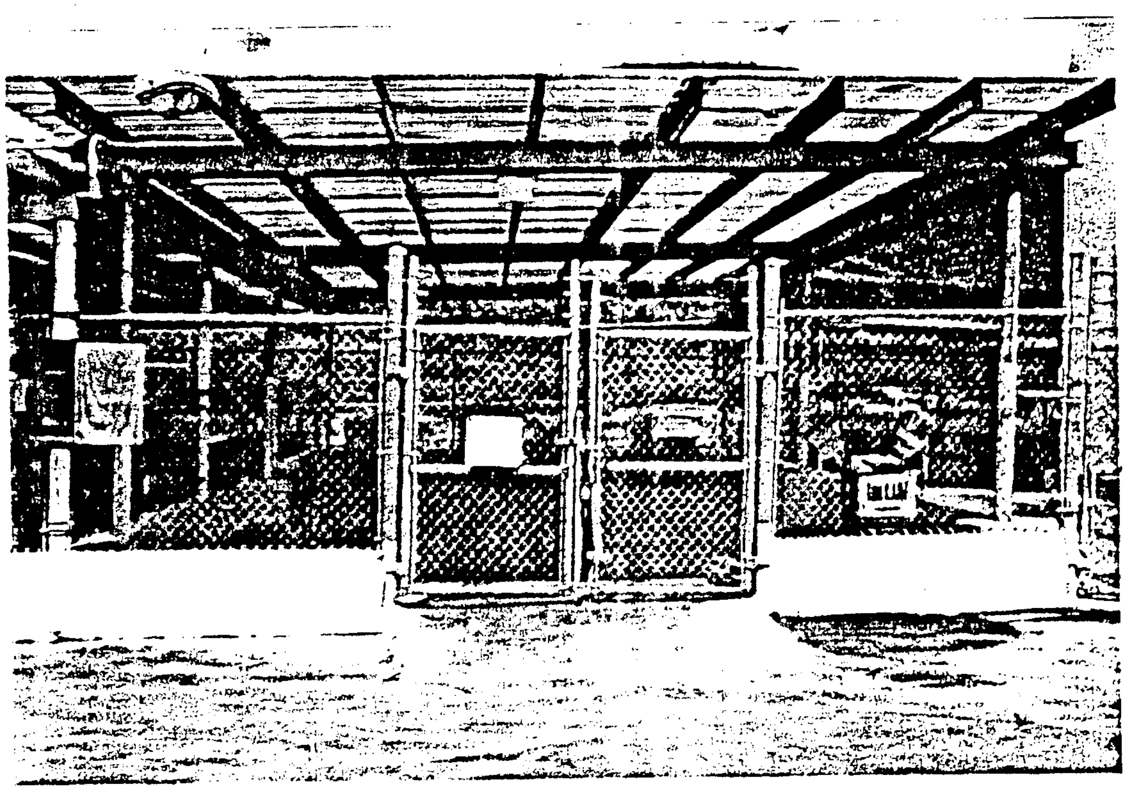


DIGITAL EQUIPMENT CORPORATION
SAN GERMAN MANUFACTURING PLANT

LOCATION MAP. scale 1:10,000

HAZARDOUS WASTE STORAGE AREA





HAZARDOUS WASTE STORAGE AREA

EXHIBIT NO. 22

D I G I T A L   I N T E R N A L   U S E   O N L Y

I N T E R O F F I C E   M E M O R A N D U M

TO: AMERICO ABADIA
ANGEL SERRANO
MANUEL GONZALEZ
VICTOR CARMONA
RAMON TOLEDO
LUIS LOPEZ
NOEL LOPEZ

DATE: NOVEMBER 22, 1989

FROM: JEANETTE L. ESCABI J.L.E/4
DEPT: ENV. ADMINISTRATION
EXT.: 721-2330
LOC.: SGO/5

SUBJECT: AIR EMISSIONS PERMIT

Attached is a copy of the Digital Air Emissions Permit to operate the listed emission sources granted by the Environmental Quality Board.

The permit expires on November 13, 1991. During the effect of the permit, Digital must notify the agency of any malfunction of the emission sources, and ensure its satisfactory operation in compliance with existing air regulations.

If you have any questions, please feel free to call.

Regards!

ep

ESTADO LIBRE ASOCIADO DE PUERTO RICO / OFICINA DEL GOBERNADOR

AI FC-gm

Junta de Calidad Ambiental

13 de noviembre de 1989

Sr. Pedro López
Gerente Facilidades de Planta
DIGITAL EQUIPMENT CORPORATION
Apartado Postal 106
San Germán, Puerto Rico 00753

RE: **DIGITAL EQUIPMENT CORP.**
SAN GERMAN, PUERTO RICO
PFE-64-0485-0348-I-II (O)

Estimado señor López::

Me refiero a su solicitud para autorización de la fuente de emisión de epígrafe.

Luego de someterse la documentación necesaria y realizarse la evaluación correspondiente, **SE AUTORIZA** la operación de la fuente de emisión de referencia en cuanto a contaminación atmosférica respecta. Esta autorización vencerá el día 13 de noviembre de 1991 y podrá ser revocada antes de esa fecha de tenerse conocimiento que han variado las condiciones bajo las cuales se otorga o se violen las disposiciones del reglamento vigente aplicable.

Las fuentes de emisión y condiciones que se autorizan con este documento se detallan en el Anejo A que forma parte de esta autorización, incluyendo aquellas indicadas en los documentos sometidos y aceptados.

Deseamos indicar que esta Junta se reserva el derecho de intervenir con dicha fuente de emisión en otros aspectos ambientales no cubiertos por esta autorización.

Cordialmente,

JUNTA DE CALIDAD AMBIENTAL

Pedro A. Maldonado Ojeda

Carlos Vázquez Ayala
Miembro Asociado

Pedro A. Maldonado Ojeda
Vice-Presidente

por: Pedro A. Maldonado Ojeda

SANTOS ROHENA BETANCOURT
Presidente

ANEJO

FUENTES DE EMISION INCLUIDAS EN ESTA AUTORIZACION

FUENTES	EQUIPO DE CONTROL	CARACTERISTICAS
Tratamiento de superficie (Multilayer ML-6) Emisiones de Acido Sulfúrico, Peróxido Sulfúrico e Hidróxido de Sodio.	Lavador de gases 95% eff.	Oxidación al cobre del panel de circuitos impresos.
Multilayer Etcher Emisiones de Hidróxido de Amonia, Acido Hidroclórico, y Cloruro de Amonia.	Lavador de gases 96% eff.	Remoción de exceso de cobre al panel de circuitos impresos.
Hole Clean Process (Multilayer LM-8) Emisiones de Permanganato de Potasio, Hidróxido de Sodio y Acido Sulfúrico.	Lavador de gases 96% eff.	Limpieza de huecos del panel de circuitos impresos (1600 diarios) para remover cobre y fiberglass.
Electroless Copper (EL-4) Emisiones de Benzonitrilo y Formaldehido	Lavador de gases 92% eff.	Deposición de cobre por medio de reacciones químicas sin corriente eléctrica al panel de circuitos impresos.
Electroless Copper (EL-5) Emisiones de Peróxido de Hidrógeno y Acido Sulfúrico	Lavador de gases 94% eff.	Deposición de cobre por medio de reacciones químicas.
Waste Treatment Emisiones de Hidróxido de Sodio, Acido Muriático, Acido Sulfúrico y Hidrosulfito de Sodio.	Lavador de gases 93% eff.	Tratamiento de desperdicios químicos.
Multilayer Stripper Emisiones de Butyl Cellosolve e Hidróxido de Amonia.	Lavador de gases 95% eff.	Procesa 1600 circuitos impresos diarios.

ANEJO

FUENTES DE EMISION INCLUIDAS EN ESTA AUTORIZACION

FUENTES	EQUIPO DE CONTROL	CARACTERISTICAS
Wet Shop Etcher Emisiones de Hidróxido de Amonia y Acido Hidroclórico	Lavador de gases 98% eff.	Remoción de exceso de cobre al panel de circuitos impresos.
Cuarto de proceso Emisiones de Acido Sulfúrico y Acido Nítrico	Lavador de gases 99% eff.	Almacenamiento de productos químicos.
Wet Shop Stripper Emisiones de Butyl Cellosolve e Hidróxido de Amonia.	Lavador de gases 98% eff.	—
ry film misiones de acetona	Ventilador	Area de inspección final.
Wave Soldering Emisiones de Plomo	Precipitador Electrostático (Smog Hog). 99% eff.	Soldadura de plomo y estaño a los módulos electrónicos.
Pattern Plate (PPN-13) Emisiones de Acido Sulfúrico, Peróxido de Hidrógeno y Sulfato de Cobre	Lavador de gases 96% eff.	Electroplateado de cobre y soldaduras de plomo y estaño al panel de circuitos impresos.
Pattern Plate (PPN-14) Emisiones de Acido Nítrico y Acido Flurobórico	Lavador de gases 95% eff.	Electroplateado de cobre y soldadura de plomo y estaño al panel de circuitos impresos.
Wet Lab (WL-15) Emisiones de Acido Sulfúrico y Acido Nítrico	Lavador de gases 99% eff.	Laboratorio para control de procesos químicos.
Dry Film Solder Mask Emisiones de Butyl Cellosolve y 1,1,1 Tricloroetano.	Ventilador	Area de inspección y lavado.
Area de híbridos misiones de Cloruro de tileno y 1,1,1 Tricloroetano	Ventilador	Manufactura de módulos
Tres (3) calderas	Chimenea	Consumen combustible Diesel #2 a razón de 35 gph. Con capacidad para producir 5,230,000 BTU/hr c/u.

ANEJO

FUENTES DE EMISION INCLUIDAS EN ESTA AUTORIZACION

FUENTES	EQUIPO DE CONTROL	CARACTERISTICAS
Generador de electricidad de emergencia (D-399)	—	Capacidad de 1310 HP Consume combustible #2 a razón de 75 gph.
Generador de electricidad de emergencia (D-3512)	—	Capacidad de 1190 HP Consume combustible #2 a razón de 330 gph.
Dos (2) generadores de electricidad de emergencia	—	Capacidad de 85 HP c/u Consumen combustible #2 a razón 77.5 gph. c/u.

EXHIBIT NO. 23

PEDRO PANZARDI & ASSOCIATES
PROCESS, ENVIRONMENTAL & PROJECT ENGINEERS
MENDEZ VIGO 10 OESTE, SUITE 6A • P.O. BOX 187 • MAYAGUEZ, P.R. 00709 • (809) 831-6120

January 26, 1990

Americo Abadia
COM Environmental &
Plant Facilities Manager
Digital Equipment Corporation
P.O. Box 106
San German, Puerto Rico 00753

Dear Mr. Abadia:

Attached you will find the Digital Operating Permit issued by EQB on January 24, 1990. This Operating Permit, PFE-LC-0190-0046-I-II-0, includes the last emission sources submitted to EQB Regional Office on January 15, 1990.

If you have any doubt, please contact me at 831-6120.

Cordially Yours,

Alberto L. Ramos

Alberto L. Ramos

/mcv

cc: Jeanette L. Escabi
Angel Serrano
Manuel Gonzalez
Jose J. Rivera

ESTADO LIBRE ASOCIADO DE PUERTO RICO / OFICINA DEL GOBERNADOR

AI-88-13

Junta de Calidad Ambiental

24 de enero de 1990

Sr. Américo Abadía
Gerente Ambiental
Digital Equipment Corporation
Apartado Postal 106
San Germán, PR 00753

ASUNTO: **DIGITAL EQUIPMENT CORPORATION**
San Germán, Puerto Rico
PFE-LC-RM-64-0190-0046-I-II-0

Estimado señor Abadía:

Me refiero a su solicitud para autorización de la fuente de emisión de epígrafe.

Luego de someterse la documentacion necesaria y realizarse la evaluación correspondiente, SE AUTORIZA la operación de la fuente de emisión de referencia en cuanto a contaminación atmosférica respecta. Esta autorización vencerá el día **24** de **e n e r o** de **1992** y podrá ser revocada antes de esa fecha de tenerse conocimiento que han variado las condiciones bajo las cuales se otorga o se violen las disposiciones del Reglamento vigente aplicable.

Las fuentes de emisión y condiciones que se autorizan con este documento son especificamente las que se detallan en el Anejo A que forma parte de esta autorización.

Deseamos indicar que esta Junta se reserva el derecho de intervenir con dicha fuente de emisión en otros aspectos ambientales no cubiertos por esta autorización.

Cordialmente,

JUNTA CALIDAD AMBIENTAL

Francisco Claudio

Francisco Claudio
Director
Area Calidad de Aire

ANEJO A

FUENTES DE EMISION INCLUIDAS EN ESTA AUTORIZACION

FUENTES	EQUIPO DE CONTROL	CARACTERISTICAS
1. Chemical Line Area Emisiones de ácido nítrico, hidróxido de sodio, ácido sulfúrico, peróxido de hidrógeno, hidróxido de amonia y cloruro de amonia.	Lavador de gases de 500 CFM Eficiencia de 99%	Procesan 1,600 circuitos impresos
2. Inner Layer New Etcher 1. Emisiones de hidróxido de amonia y cloruro de amonia	Lavador de gases de 1,500 CFM Eficiencia de 99%	Procesa 1,600 circuitos impresos
3. nner Layer New Etcher 2. misiones de monoetanolamina	Lavador de gases de 400 CFM Eficiencia de 99%	Procesa 1,600 circuitos impresos
4. Solder Strip & Microetch Emisiones de ácido sulfúrico y peróxido de hidrógeno	Lavador de gases de 3,000 CFM Eficiencia de 99%	Procesa 1,600 circuitos impresos
5. Pre-Clean and Post Clean Module Emisiones de peróxido de hidrógeno, ácido sulfúrico e hidróxido de sodio	Lavador de gases de 3,000 CFM Eficiencia de 99%	Procesa 1,600 circuitos impresos
6. Generador de Electricidad de Emergencia	—	Consume combustible Diesel a razón de 11 gph. capacidad de 235 HP
7. Hot Solder Leveling	"Smog Hog" Eficiencia de 99%	Procesa 1,600 circuitos impresos

ANEJO

FUENTES DE EMISION INCLUIDAS EN ESTA AUTORIZACION

FUENTES	EQUIPO DE CONTROL	CARACTERISTICAS
8. Generador de Electricidad	—	Capacidad de 300 HP. Consume Diesel a razón de 17.8 gph.
9. Sludge Dryer	Chimenea	Procesa 6.000 lbs. sludge diarias.

EXHIBIT NO. 24

[illegible] MANIFEST

07/15/89

HAZARDOUS WASTE MANIFEST

TOTAL MANIFEST OF: DIGITAL EQUIPMENT CORPORATION

EPA ID. NO. : PRD991291857

#1 TRANSP ID NO. / NAME & DATE									
#2 TRANSP ID NO. / NAME & DATE									
#3 TRANSP ID NO. / NAME & DATE									
TSD FACIL ID NO. & NAME									
GENERATOR ID NO. & NAME		NET		CONTAINERS		HAZ	WASTE	HANDLING	
DOC. NO.	FORM	QUANTITY	UNITS	NO.	TYPE	CODE	TYPE	CODE	
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PRD090220732	JUAN E HERNANDEZ INC							09/10/85	
PRD090??????	PUERTO RICO MARINE MANAGEMENT INC							09/11/85	
PA[illegible]0061								09/14/85	
PAD000[illegible]								11/14/85	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							/ /	
PR00001		00027.41	M	018	BA		F006	T59	HO
PRT000019539	EQUIPOS DE BORINQUEN INC							02/18/86	
PRD000706390	PUERTO RICO MARINE MANAGEMENT INC							/ /	
A[illegible]D000841460								/ /	
RID040098352	NORTH LAND CHEMICAL							02/28/86	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							02/18/86	
PR00017		00030.07	M	001	TT		D002	T66	HO
PRT000019539	EQUIPOS DE BORINQUEN INC							04/04/86	
PRD000706390	PUERTO RICO MARINE MANAGEMENT INC							04/07/86	
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OTI001164599	MAC DERMID INC.							05/05/86	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							04/04/86	
PR00018		00124.00	G	010	CY		D002	T66	HO
PRD090220732	JUAN E HERNANDEZ INC							04/08/86	
PRD090559360	TRAILER MARINE TRANSPORT CORP							04/22/86	
FLD000792578								/ /	
AZD980735500	WRC PROCESSING COMPANY							04/30/86	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							04/08/86	
PR00019		00021.77	M	032	BA		F006	T23	HO
PRD090220732	JUAN E HERNANDEZ INC							04/09/86	
PRD090559360	TRAILER MARINE TRANSPORT CORP							04/22/86	
FLD000792578								/ /	
AZD980735500	WRC PROCESSING COMPANY							04/30/86	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							04/09/86	
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PRD090220732	JUAN E HERNANDEZ INC							04/11/86	
PRD090559360	TRAILER MARINE TRANSPORT CORP							04/11/86	
FLD000792578								/ /	
AZD980735500	WRC PROCESSING COMPANY							04/30/86	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							04/11/86	
PR00021		00017.13	M	021	BA		F006	T23	HO
PRT000019539	EQUIPOS DE BORINQUEN INC							07/11/86	

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TOTAL MANIFEST FOR DIGITAL EQUIPMENT CORPORATION

EPA ID. NO. : [illegible]

[illegible] NAME & DATE
[illegible] NAME & DATE
[illegible] NAME & DATE
[illegible]

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							/ /	
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[illegible]	DIGITAL EQUIPMENT CORPORATION						05/07/86	
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PRD090559360	TRAILER MARINE TRANSPORT CORP						07/07/86	
FLD007922578							/ /	
AZD980735500	WRC PROCESSING COMPANY						07/29/86	
PRD991291857	DIGITAL EQUIPMENT CORPORATION						07/07/86	
PR00029		00016.04	M	019 BA		F006	T23	HO
PRT000019539	EQUIPOS DE BORINQUEN INC						07/15/87	
PRD000706390	PUERTO RICO MARINE MANAGEMENT INC						/ /	
CTD980521280							/ /	
CTD001164599	MAC DERMID, INC.						/ /	
PRD991291857	DIGITAL EQUIPMENT CORPORATION						07/15/87	
PR00030		00079.00	G	006 CY		D002	T66	HO
PRD000692566	CARRERAS TRUCKING COMPANY						08/15/86	

07/26/89 [illegible] HAZARDOUS WASTE MANIFEST [illegible] PAGE [illegible]

TOTAL MANIFEST FOR DIGITAL EQUIPMENT CORPORATION

[illegible]

[illegible] NAME & DATE
[illegible] NAME & DATE
[illegible]
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PRD000706390	PUERTO RICO MARINE MANAGEMENT INC							10/07/86	
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PRD000706390	PUERTO RICO MARINE MANAGEMENT INC							09/29/86	
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PRD991291857	DIGITAL EQUIPMENT CORPORATION							09/27/86	
PR00037		00019.06	M	001	TT		D002	T66	HO
PRD090220732	JUAN E HERNANDEZ INC							11/04/86	
PRD090559360	TRAILER MARINE TRANSPORT CORP							11/07/86	
PAD980830061								11/25/86	
PAD981038227	WRC PROCESSING COMPANY (RECLAMATION FACI							11/25/86	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							11/04/86	
PR00042		00021.04	M	025	DA		F006	T23	HO
PRD090220732	JUAN E HERNANDEZ INC							11/05/86	
PRD090559360	TRAILER MARINE TRANSPORT CORP							11/05/86	
PAD980830061								11/21/86	
PAD981038227	WRC PROCESSING COMPANY (RECLAMATION FACI							11/21/86	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							11/05/86	
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PRD000692566	CARRERAS TRUCKING COMPANY							11/21/86	
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PRD090399718	SAFETY KLEEN ENVIROSYSTEMS							11/21/86	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							11/21/86	
PR00045		00770.00	G	014	DM		D001	S01	HO
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TOTAL MANIFEST [illegible] DIGITAL EQUIPMENT CORPORATION
EPA ID [illegible]

[illegible] NAME & DATE
[illegible] NAME & DATE
[illegible]

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[illegible]210732	JUAN E HERNANDEZ INC							05/16/86	
[illegible]559360	TRAILER MARINE TRANSPORT CORP							05/19/86	
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PR0091018622	PROTECCION TECNICA ECOLOGICA (PROTECO)							09/12/85	
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								/ /	
PR0091018622	PROTECCION TECNICA ECOLOGICA (PROTECO)							09/12/85	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							/ /	
PR0[illegible]42		00016.00	Y	016	CW		F006	S01	HO
[illegible]	JUAN E HERNANDEZ INC							05/19/86	

[illegible] [illegible] [illegible] PAGE [illegible]

TOTAL MANIFEST [illegible] DIGITAL EQUIPMENT CORPORATION

EPA [illegible]

[illegible] NAME & DATE
[illegible] NAME & DATE
[illegible] NAME & DATE
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GENERATOR ID NO. [illegible]				[illegible]	[illegible]	[illegible]	WASTE	HANDLING	
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[illegible]								[illegible]	
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PRT[illegible]	EQUIPOS DE BORINQUEN INC							06/05/86	
PRD000706390	PUERTO RICO MARINE MANAGEMENT INC							06/06/86	
RID000841460								/ /	
RID001200252								06/11/86	
PRD991291657	DIGITAL EQUIPMENT CORPORATION							06/03/86	
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PRD090210732	JUAN E HERNANDEZ INC							08/12/86	
PRD090559160	TRAILER MARINE TRANSPORT CORP							09/22/86	
FLD007922578								/ /	
AZD980735500	WRC PROCESSING COMPANY							09/26/86	
PRD991291657	DIGITAL EQUIPMENT CORPORATION							08/12/86	
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PRD090210732	JUAN E HERNANDEZ INC							08/13/86	
PRD090559160	TRAILER MARINE TRANSPORT CORP							08/14/86	
FLD077922578								09/03/86	
AZD980735500	WRC PROCESSING COMPANY							09/10/86	
PRD991291657	DIGITAL EQUIPMENT CORPORATION							08/13/86	
PR0032		00021.05	M	025	BA		F006	T23	HO
PRT000019539	EQUIPOS DE BORINQUEN INC							09/08/86	
PRD000706390	PUERTO RICO MARINE MANAGEMENT INC							09/08/86	
RID000841460								/ /	
RID001200252								/ /	
PRD991291657	DIGITAL EQUIPMENT CORPORATION							09/07/86	
PR0034		00147.00	G	004	DF		F007	T66	HO
PRT000019539	EQUIPOS DE BORINQUEN INC							09/26/86	
PRD000706390	PUERTO RICO MARINE MANAGEMENT INC							09/26/86	
NJD000813477								10/10/86	
NJD002141950								10/10/86	
PRD991291657	DIGITAL EQUIPMENT CORPORATION							09/26/86	
PR0035		02860.00	G	[illegible]	CM		D002	T66	HO
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PRT000019539	EQUIPOS DE BORINQUEN INC							04/14/85	

[illegible] WASTE MANIFEST [illegible]

TOTAL MANIFEST [illegible] CORPORATION

EPA ID [illegible]

[illegible] NAME & DATE
[illegible] NAME & DATE
[illegible] NAME & DATE

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				NO.	TYPE		TYPE		
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PR00[illegible]		[illegible]		[illegible]	DM		F007	T[illegible]	

[illegible]	[illegible] INC						10/22/86	
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[illegible]							11/24/86	
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PRD090220732	JUAN E HERNANDEZ INC						11/04/86	
PRD090559360	TRAILER MARINE TRANSPORT CORP						/ /	
PRD090220732	JUAN E HERNANDEZ INC						/ /	
MAD981038227	WRC PROCESSING COMPANY (RECLAMATION FACI						/ /	
PRD991291857	DIGITAL EQUIPMENT CORPORATION						11/04/86	
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PRD090220732	JUAN E HERNANDEZ INC						11/05/86	
PRD090559360	TRAILER MARINE TRANSPORT CORP						/ /	
PRD090220732	JUAN E HERNANDEZ INC						/ /	
MAD981038227	WRC PROCESSING COMPANY (RECLAMATION FACI						/ /	
PRD991291857	DIGITAL EQUIPMENT CORPORATION						11/05/86	
PR0043		00021.04	M	025	BA	F006	T23	WO

PRD000619539	EQUIPOS DE BORINQUEN INC						11/17/86	
PRD000706390	PUERTO RICO MARINE MANAGEMENT INC						11/17/86	
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[illegible]001164599	MAC DERMID, INC.						12/12/86	
PRD991291857	DIGITAL EQUIPMENT CORPORATION						11/17/86	
PR0044		00130.00	G	010	CY	D002	S01	WO

PRD090220732	JUAN E HERNANDEZ INC						12/16/86	
PRD090559360	TRAILER MARINE TRANSPORT CORP						01/09/87	
AZR050010008							/ /	
AZD980735500	WRC PROCESSING COMPANY						01/23/87	
PRD991291857	DIGITAL EQUIPMENT CORPORATION						12/16/86	
PR0046		00021.04	M	025	BA	F006	T23	WO

PRD090220732	JUAN E HERNANDEZ INC	12/17/86
PRD090559360	TRAILER MARINE TRANSPORT CORP	01/09/87

[illegible] HAZARDOUS WASTE MANIFEST PAGE [illegible]
TOTAL MANIFEST FOR DIGITAL EQUIPMENT CORPORATION
EPA ID NO. [illegible]

[illegible] ID NO. / NAME & DATE
[illegible] ID NO. / NAME & DATE
[illegible] ID NO. / NAME & DATE
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[illegible] [illegible] QUANTITY UNITS [illegible] TYPE [illegible] TYPE CODE

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PRD991291857    DIGITAL EQUIPMENT CORPORATION                                 [illegible]
PR[illegible]            0002[illegible]                [illegible]  PA        F006        T[illegible]     HO
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PRD090220732    JUAN E HERNANDEZ INC                                          [illegible]
PRD090559360    TRAILER MARINE TRANSPORT CORP                                 02/10/86
FLD007921578                                                                   /  /
AZD980735500    WRC PROCESSING COMPANY                                        03/18/86
PRD991291857    DIGITAL EQUIPMENT CORPORATION                                 02/07/86
PR01[illegible]          000[illegible]7.04       X    [illegible]  PA        F006        T23         HO
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PRD000706291    ASHLAND CHEMICAL COMPANY                                      12/07/87
PRD000706390    PUERTO RICO MARINE MANAGEMENT INC                              /  /
MCD095038998                                                                   /  /
ALD000622464    CHEMICAL WASTE MANAGEMENT, INC.                                /  /
PRD991291857    DIGITAL EQUIPMENT CORPORATION                                 12/07/87
PR87001              40000.00       P    020  CW                    D008        D81         HO
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PRD000692566    CARRERAS TRUCKING COMPANY                                     01/21/87
                                                                               /  /
                                                                               /  /
[illegible]     SAFETY KLEEN ENVIROSYSTEMS                                    01/21/87
PRD991291857    DIGITAL EQUIPMENT CORPORATION                                 01/21/87
PR87002              00275.00       G    [illegible]  DM        D001        S01         HO
                     00440.00       G    008  DM                D001        S01
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PRD000706291    ASHLAND CHEMICAL COMPANY                                      12/11/87
PRD000706291    ASHLAND CHEMICAL COMPANY                                       /  /
MCD095038998                                                                   /  /
ALD000622464    CHEMICAL WASTE MANAGEMENT, INC.                                /  /
PRD991291857    DIGITAL EQUIPMENT CORPORATION                                 12/11/87
PR87003              36000.00       P    [illegible]  CW            D008        D81         HO
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PRD090220732    JUAN E HERNANDEZ INC                                          01/26/87
PRD090559360    TRAILER MARINE TRANSPORT CORP                                 01/27/87
AZT050010008                                                                  02/16/87
AZD980735500    WRC PROCESSING COMPANY                                        02/26/87
PRD991291857    DIGITAL EQUIPMENT CORPORATION                                 01/26/87
PR87004              00021.05       X    025  PA                    F006        T23         HO
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PRT000019539    EQUIPOS DE BORINQUEN INC                                      02/06/87
PRD000706390    PUERTO RICO MARINE MANAGEMENT INC                              /  /
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[illegible] GENERATOR'S WASTE MANIFEST PAGE [illegible]
TOTAL MANIFEST FOR DIGITAL EQUIPMENT CORPORATION
EPA ID. NO.: [illegible]

1ST TRANSP ID NO., NAME & DATE
2ND TRANSP ID NO., NAME & DATE
3RD TRANSP ID NO., NAME & DATE
[illegible]
[illegible] NAME [illegible] CONTAINER HAZ WASTE HANDLING
[illegible] NO. [illegible] QUANTITY UNITS NO. TYPE CODE TYPE CODE
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[illegible]
[illegible] DIGITAL EQUIPMENT CORPORATION [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible] D001 [illegible] [illegible]

PRD000692566 CARRERAS TRUCKING COMPANY 03/19/87
/ /
/ /
[illegible] SAFETY KLEEN ENVIROSYSTEMS 03/19/87
PRD991291857 DIGITAL EQUIPMENT CORPORATION 03/19/87
PR87007 [illegible] G 005 DM D001 S01 HO
[illegible] G 007 DM D001 S01

PRD090220732 JUAN E HERNANDEZ INC 03/24/87
PRD090559360 TRAILER MARINE TRANSPORT CORP 03/25/87
FLD007922578 04/07/87
AZD980735500 WRC PROCESSING COMPANY 04/15/87
PRD991291857 DIGITAL EQUIPMENT CORPORATION 03/24/87
PR87009 00021.05 M 025 BA F006 T23 HO

PRD090220732 JUAN E HERNANDEZ INC 03/25/87
PRD090559360 TRAILER MARINE TRANSPORT CORP 03/27/87
FLD007922578 04/07/87
AZD980735500 WRC PROCESSING COMPANY 04/15/87
PRD991291857 DIGITAL EQUIPMENT CORPORATION 03/25/87
PR87010 00021.05 M 025 BA F006 T23 HO

PRD090220732 JUAN E HERNANDEZ INC 04/16/87
PRD090559360 TRAILER MARINE TRANSPORT CORP / /
FLD007922578 / /
AZD980735500 WRC PROCESSING COMPANY 05/20/87
PRD991291857 DIGITAL EQUIPMENT CORPORATION 04/16/87
PR87011 00021.05 M 025 BA F006 T23 HO

PRD000692566 CARRERAS TRUCKING COMPANY 05/12/87
/ /
/ /
PRD090399718 SAFETY KLEEN ENVIROSYSTEMS / /
PRD991291857 DIGITAL EQUIPMENT CORPORATION 05/12/87
PR87012 00495.00 G 009 DM D001 S01 HO

PRD090220732 JUAN E HERNANDEZ INC 07/04/87
PRD090559360 TRAILER MARINE TRANSPORT CORP / /

TOTAL MANIFEST FOR DIGITAL EQUIPMENT CORPORATION
EPA ID. NO. : PRD991291857

[illegible] ID NO. / NAME & DATE
[illegible] ID NO. / NAME & DATE
[illegible] / NAME & DATE
[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	TYPE	[illegible]	WASTE TYPE	HANDLING CODE	
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PR87019		[illegible]	[illegible]	[illegible]	BA		F006	T18	HO
PRD0902[illegible]	JUAN E HERNANDEZ INC							09/02/87	
PRD09[illegible]	TRAILER MARINE TRANSPORT CORP							/ /	
[illegible]7922578								/ /	
A[illegible]80735509	WRC PROCESSING COMPANY							11/04/87	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							09/02/87	
PR8702[illegible]		[illegible]	M	02[illegible]	BA		F006	T23	HO
PRD00069[illegible]	CARRERAS TRUCKING COMPANY							07/17/87	
								/ /	
								/ /	
PRD090399718	SAFETY KLEEN ENVIROSYSTEMS							07/17/87	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							07/17/87	
PR87021		00330.00	G	006	DM		D001	T16	HO
		00660.00	G	012	DM		D001	T16	
PRD090220732	JUAN E HERNANDEZ INC							08/03/87	
PRD090559360	TRAILER MARINE TRANSPORT CORP							08/07/87	
FLD007922578								08/28/87	
AZD980735509	WRC PROCESSING COMPANY							09/04/87	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							08/03/87	
PR87022		00018.09	M	022	BA		F006	T18	HO
PRT000014839	EQUIPOS DE BORINQUEN INC							08/07/87	
PRD000706390	PUERTO RICO MARINE MANAGEMENT INC							/ /	
SCD000822312								/ /	
SCD070371885								/ /	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							08/03/87	
PR87023		00022.04	M	001	TT		D002	T66	HO
PRD000692566	CARRERAS TRUCKING COMPANY							08/25/87	
								00/00/00	
								00/00/00	
PRD090399718	SAFETY KLEEN ENVIROSYSTEMS							08/25/87	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							08/25/87	
PR87024		07500.00	G	001	TT		D001	T16	HO
PRD000692566	CARRERAS TRUCKING COMPANY							08/17/87	
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TOTAL MANIFEST [illegible] DIGITAL EQUIPMENT CORPORATION
EPA ID [illegible]

[illegible] NAME & DATE
[illegible] NAME & DATE
[illegible]
[illegible]

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		[illegible]			DM		D001	[illegible]	

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[illegible]	DIGITAL EQUIPMENT CORPORATION						09/02/87	
[illegible]	[illegible]	[illegible]	[illegible]	PA		F006	T18	HO

PRT000019539	EQUIPOS DE BORINQUEN INC						09/25/87	
PRD000706390	PUERTO RICO MARINE MANAGEMENT INC						/ /	
NJD000813477							/ /	
NJD002141950							10/14/87	
PRD991291857	DIGITAL EQUIPMENT CORPORATION						09/25/87	
PR87027	[illegible]	[illegible]	[illegible]	DM		D002	T66	HO
	01540.00	G	[illegible]	DM		D002	T04	

PRT000019539	EQUIPOS DE BORINQUEN INC						09/25/87	
PRD000706390	PUERTO RICO MARINE MANAGEMENT INC						/ /	
NJD000813477							/ /	
NJD002141950							10/14/87	
PRD991291857	DIGITAL EQUIPMENT CORPORATION						09/25/87	
PR87027B	00825.00	G	[illegible]	DM		D002	T04	HO
	01540.00	G	[illegible]	DM		D002	T04	

PRD090220732	JUAN E HERNANDEZ INC						01/06/87	
PRD090559360	TRAILER MARINE TRANSPORT CORP						/ /	
FLD007922578							/ /	
AZD980735500	WRC PROCESSING COMPANY						0 / /	
PRD991291857	DIGITAL EQUIPMENT CORPORATION						10/06/87	
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PRT000019539	EQUIPOS DE BORINQUEN INC						10/21/87	
PRD000706390	PUERTO RICO MARINE MANAGEMENT INC						/ /	
CTD980521306							/ /	
CTD001164599	MAC DERMID, INC.						11/03/87	
PRD991291857	DIGITAL EQUIPMENT CORPORATION						10/21/87	
PR87029	00013.00	G	001	CY		D002	T66	HO

HAZARDOUS WASTE MANIFEST PAGE [illegible]

TOTAL MANIFEST FOR DIGITAL EQUIPMENT CORPORATION

EPA ID. NO. : PRD991291857

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[illegible] NAME & DATE

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PR87[illegible]		[illegible]	M	025	BA		F006	T23	HO
PRD000692566	CARRERAS TRUCKING COMPANY							10/22/87	
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								/ /	
PRD090399718	SAFETY KLEEN ENVIROSYSTEMS							10/[illegible]/87	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							10/22/87	
PR87030		00440.00	G	088	DM		D008	T16	HO
		00385.00	G	007	DM		D001	T16	
PRD090220732	JUAN E HERNANDEZ INC							11/04/87	
PRD090589360	TRAILER MARINE TRANSPORT CORP							11/08/87	
FLD007922578								11/19/87	
AZD980735500	WRC PROCESSING COMPANY							11/26/87	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							11/06/87	
PR87033		00016.03	M	019	BA		F006	T18	HO
PRD090220732	JUAN E HERNANDEZ INC							12/02/87	
PRD090589360	TRAILER MARINE TRANSPORT CORP							12/03/87	
FLD007922578								12/21/87	
AZD980735500	WRC PROCESSING COMPANY							01/04/88	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							12/02/87	
PR87034		00021.05	M	025	BA		F006	T18	HO
PRD000692566	CARRERAS TRUCKING COMPANY							05/12/87	
								/ /	
								/ /	
PRD090399718	SAFETY KLEEN ENVIROSYSTEMS							05/12/87	
PRD991291857	DIGITAL EQUIPMENT CORPORATION							05/12/87	
PR8712		00495.00	G	009	DM		D001	S01	HO

TOTAL MANIFEST [illegible] DIGITAL EQUIPMENT CORPORATION

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[illegible] NAME & DATE
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								/ /
[illegible]	SAFETY KLEEN ENVIROSYSTEMS							06/29/88
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[illegible]	JUAN E HERNANDEZ INC							[illegible]
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[illegible]922578								/ /
[illegible]	WRC PROCESSING COMPANY							/ /
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PR880[illegible]		[illegible]	[illegible]	[illegible]	[illegible]		F006	T19

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PR88005		00021.05	4	025	34		F006	T19

PR0090399718	SAFETY KLEEN ENVIROSYSTEMS							03/08/88
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PR0090399718	SAFETY KLEEN ENVIROSYSTEMS							03/08/88
PR0991291857	DIGITAL EQUIPMENT CORPORATION							03/08/88
PR88007		00605.00	G	011	DM		D008	T16
		00165.00	G	003	DM		D001	T16
		00165.00	G	003	DM		D001	T16

PR0090220732	JUAN E HERNANDEZ INC							03/17/88
PR0090559360	TRAILER MARINE TRANSPORT CORP							/ /
FL0007922578								/ /
AZD980735500	WRC PROCESSING COMPANY							/ /

[illegible] PAGE [illegible]

HAZARDOUS WASTE MANIFEST

TOTAL MANIFEST FOR [illegible]

EPA ID [illegible]

[illegible] NAME & DATE
[illegible] NAME & DATE
[illegible]

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[illegible] WRC PROCESSING COMPANY 04/20/88
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[illegible] JUAN E HERNANDEZ INC [illegible]
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PR88013 00021.05 [illegible] 025 PA F006 T18

[illegible] EQUIPOS DE BORINQUEN INC [illegible]
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[illegible]61347 07/11/88
[illegible]21490 07/12/88
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PR88017 00715.00 [illegible] 013 DM D002 T04
00495.00 [illegible] 009 [illegible] D002 T04

PRD090220732 JUAN E HERNANDEZ INC 06/17/88
PRD090559360 TRAILER MARINE TRANSPORT CORP 06/20/88
[illegible]7922579 07/07/88
[illegible]0735500 WRC PROCESSING COMPANY 07/15/88
PRD091241857 DIGITAL EQUIPMENT CORPORATION 06/17/88
PR88018 00021.05 [illegible] [illegible] PA F006 T18

PRD090399718 SAFETY KLEEN ENVIROSYSTEMS 07/05/88
PRD040692566 CARRERAS TRUCKING COMPANY / /
PRD090559360 TRAILER MARINE TRANSPORT CORP / /
LAD010395127 ROLLINS ENVIRONMENTAL SERVICES / /

[illegible] TOTAL MANIFEST [illegible] DIGITAL EQUIPMENT CORPORATION [illegible]

EPA I.D. [illegible]

[illegible] NAME & DATE
[illegible] NAME & DATE
[illegible]

[illegible] SAFETY KLEEN [illegible] 06/29/88
/ /
/ /
[illegible] SAFETY KLEEN ENVIROSYSTEMS 06/29/88
[illegible] DIGITAL EQUIPMENT CORPORATION 06/29/88

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	F001	T16
	00110.00	[illegible]	[illegible]	[illegible]	F002	T16

[illegible] ASHLAND CHEMICAL COMPANY 07/15/88
[illegible] ROBERTO RIVERA MARINE MANAGEMENT INC / /
[illegible] / /
[illegible] CHEMICAL WASTE MANAGEMENT, INC. / /
PRD991291857 DIGITAL EQUIPMENT CORPORATION 07/15/88

PR88045	[illegible]	G	[illegible]	DM	D002	T21
	[illegible]	G	[illegible]	DM	D002	T21

PRD090399718 SAFETY KLEEN ENVIROSYSTEMS 07/22/88
/ /
/ /
PRD090399718 SAFETY KLEEN ENVIROSYSTEMS 07/22/88
PRD991291857 DIGITAL EQUIPMENT CORPORATION 07/22/88

PR88045	00110.00	G	002	DM	F001	T16
	00110.00	G	002	DM	D001	T16

PRD090270732 JUAN E HERNANDEZ INC 07/29/88
PRD090559360 TRAILER MARINE TRANSPORT CORP 08/01/88
FLD007922578 08/22/88
AZD980735500 WRC PROCESSING COMPANY 09/01/88
PRD991291857 DIGITAL EQUIPMENT CORPORATION 07/29/88

PR88046	00021.05	M	005	BA	F006	T18

PRD000706366 ORLANDO GONZALEZ TRUCKING 08/08/88
PRD090559360 TRAILER MARINE TRANSPORT CORP / /
ALD099202681 / /
ALD000622464 CHEMICAL WASTE MANAGEMENT, INC. / /
PRD991291857 DIGITAL EQUIPMENT CORPORATION 08/08/88

PR88053	00020.00	M	020	BA	F006	D81

PRD000706366 ORLANDO GONZALEZ TRUCKING 07/08/88
PRD090559360 TRAILER MARINE TRANSPORT CORP. / /

TOTAL MANIFEST TO DIGITAL EQUIPMENT CORPORATION
EPA ID [illegible]

[illegible] NAME & DATE
[illegible] NAME & DATE
[illegible]
[illegible]
GENERATOR [illegible] NAME [illegible] CONTAINERS HAZ WASTE [illegible]
[illegible] TYPE CODE TYPE CODE

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[illegible] [illegible] [illegible] BA F006 D81

PRD000706366 ORLANDO GONZALEZ TRUCKING 08/08/88
PRD090559360 TRAILER MARINE TRANSPORT CORP / /
ALD099202681 / /
ALD000622464 CHEMICAL WASTE MANAGEMENT, INC. / /
PRD991291857 DIGITAL EQUIPMENT CORPORATION 08/08/88
PR88055 00020.00 M 020 BA F006 D81

PRD000706366 ORLANDO GONZALEZ TRUCKING 08/14/88
PRD090559360 TRAILER MARINE TRANSPORT CORP / /
ALD099202681 / /
ALD000622464 CHEMICAL WASTE MANAGEMENT, INC. / /
PRD991291857 DIGITAL EQUIPMENT CORPORATION 08/14/88
PR88065 00020.00 M 020 BA F006 D81

PRD090399718 SAFETY KLEEN ENVIROSYSTEMS 08/17/88
00/00/00
00/00/00
PRD090399718 SAFETY KLEEN ENVIROSYSTEMS 08/17/88
PRD991291857 DIGITAL EQUIPMENT CORPORATION 08/17/88
PR88070 00440.00 G 008 DM F003 T16
00275.00 G 005 DM F003 T16

PRD090220732 JUAN E HERNANDEZ INC 08/19/88
PRD090559360 TRAILER MARINE TRANSPORT CORP 08/22/88
AZD982316531 09/21/88
AZD980735500 WRC PROCESSING COMPANY 09/21/88
PRD991291857 DIGITAL EQUIPMENT CORPORATION 08/19/88
PR88071 00023.05 M 025 BA F006 T18

PRD000706366 ORLANDO GONZALEZ TRUCKING 08/20/88
PRD090559360 TRAILER MARINE TRANSPORT CORP / /
ALD090202681 / /
ALD000622464 CHEMICAL WASTE MANAGEMENT, INC. / /
PRD991291857 DIGITAL EQUIPMENT CORPORATION 08/20/88
PR88086 00020.00 M 020 BA F006 D81

PRD090399718 SAFETY KLEEN ENVIROSYSTEMS 09/07/88
/ /

[illegible]

HAZARDOUS WASTE MANIFEST

TOTAL MANIFEST FOR DIGITAL EQUIPMENT CORPORATION

EPA ID. NO. : [illegible]

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#2 TRANSP ID NO. / NAME & DATE								
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TSD FACIL ID NO. / NAME								
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TOTAL MANIFEST FOR DIGITAL EQUIPMENT CORPORATION
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TOTAL MANIFEST FOR DIGITAL EQUIPMENT CORPORATION

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HAZARDOUS WASTE MANIFEST — PAGE [illegible]

TOTAL MANIFEST FOR DIGITAL EQUIPMENT CORPORATION

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MANIFEST TOTAL -> 123

EXHIBIT NO. 25

APPENDIX B

FIELD REPORT

CARIBBEAN SOIL TESTING COMPANY, INC.

FIELD REPORT
Subsoil Exploration and
Observation Well Installation at
San German Site, Puerto Rico

CARIBBEAN SOIL TESTING CO. INC.

SOIL AND MATERIALS TESTING LABORATORY

OFFICES

SAN JUAN, 258 Chile St., Hato Rey, G.P.O. Box 3967, San Juan, Puerto Rico 00936
Phones (809) 753-0147, 753-0143, 759-7880
MAYAGUEZ, 258 McKinley St., P.O. Box 1073, Mayaguez, Puerto Rico 00708
Phone (809) 832-7612

TO: Digital Equipment Corporation
P.O. Box 106
San Germán, Puerto Rico 00753

SUBJECT: Subsoil Exploration and Observation Well Installation at San German Site, Puerto Rico

INTRODUCTION:

This report presents a summary of scope of services rendered in the soil exploratory drilling, corresponding field sample securing and installation of Observation Wells at Highway 362 plant site, San German, Puerto Rico.

The boring exploration was conducted following the terms of the contract-scope of services, as requested by Eng. Stephen Greene, Senior Environmental Engineer of Digital Equipment Corporation. The technical aspect of the work was made in accordance to the scope of work and procedures delineated by Eng. Mike Powers of the firm Goldberg - Zoino and Associates, Consultants to the project.

FIELD WORK:

The drilling work and sampling securing was made in accordance with ASTM Designation D-1586-67 and D-2113.

The work consisted of drilling four (4) test holes by means of the hollow stem auger method of drilling. Drilling through rock was made with a double tube core barrel with diamond bit (NWM-size).

After proper identification of the soil and rock samples, directly at the field, they were placed in well-labeled, air-tight jars or wooden boxes, for soil and rock samples respectively and sent to our soil laboratory for routine testing, as per ASTM Designations.

After the holes were drilled four (4) observation wells were installed. The depth at which the tip of the PVC screens for each of the wells was placed is as follow:

Table No. 1: Depth of Tip of Well Screen:

Test Hole No.	Total Depth of Hole (ft)	Depth of Observation Well Tip (ft)
OW-1	44.6	36.5
OW-2	15.5	10.5
OW-2.1	40.0	35.0
OW-3	9.2	7.0

The wells were constructed with 1-1/2" O.D. PVC pipes provided by Digital Equipment Corporation.

The tips of the wells consisted of sections of 1.5" schedule 80 slotted PVC Pipes, or similar provided by Digital Equipment Corporation. The bottom of the holes were sealed with bentonite pellets.

To avoid vandalism to the wells, a security system consisting of a 2-1/2" N.D. pipe with a flushed type cap, was provided.

The total footage drilled at the subject project was of 109.3 lineal feet of boring.

In accordance to the project contract and as required by Eng. Mike Powers, supervisor to the project, the following routine and special laboratory tests were made on selected samples secured in the exploration.

		ASTM Designation
a.	"Description of Soils" --------------------	D-2488-69
b.	"Combined Grain Size Analyses"-------------	D-422-63

The results of the tests are shown in the enclosed boring logs and tables.

The standard procedures followed during the drilling of the test borings, laboratory and field testing, are discussed in detailed form in the

Appendixes to this report.

Respectfully submitted,

CARIBBEAN SOIL TESTING CO., INC.

BENIGNO DESPIAU - Chief Engineer

April 22, 1983

Reference Number: 83-4636

mv

Enclosures:

1. Appendix I (1 thru 4)

2. Borehole Record Sheets

3. Combined Grain Size Analysis Graphs

4. Boring Location Map

cc: Eng. Mike Powers of the firm Goldberg - Zoino & Associates

The borings were made by the wash boring process. This drilling process consists of driving sections of 2-1/2" casings into the ground by a drop-hammer operation, as in pile-driving. After each length of casing has been driven, the earth material inside the casing is cleaned out by a chopping and washing process similar to jetting. This is accomplished by forcing water under pressure through rods or pipes which are operated inside the casing. A chisel-shaped chopping bit is attached to the end of the rods and the whole string alternately is raised and dropped so that the resultant chopping and jetting action loosens the soil. The return flow of water brings the cuttings to the surface. Soil samples are secured from the bottom of the cleaned hole by means of a 1-3/8" I. D. Split Spoon Sampler. While securing the soil samples, the Standard Penetration Test is performed and the "N" values obtained. This is the number of blows required to drive the sampling spoon a distance of one (1.0) ft into the ground with a 140 lbs hammer falling 30 inches. The "N" values give an indication of the consistency of cohesive soils and the relative density of granular soils, as follows:

COHESIVE SOILS

"N" values blows/ft	Consistency	Unconfined Compressive Strength (TSF)
less than 2	very soft	less than 0.25
2-4	soft	0.25-0.50
4-8	medium	0.50-1.00
8-15	stiff	1.00-2.00
15-30	very stiff	2.00-4.00
more than 30	hard	+ 4.00

APPENDIX 1-2

GRANULAR SOILS

"N" values blows/ft	Relative Density
0-5	very loose
5-10	loose
10-30	medium
30-50	dense
over 50	very dense

The samples recovered with the split spoon sampler are known as disturbed samples, where the natural structure of the subsoil is broken in the sampling process. Thus, the soil particles recovered in the sampling device most frequently loose the linking or cementing characteristics they possess in their natural position. For example, there are some relatively soft types of rock formations that can be sampled, at least for some depth, with a split spoon sampler. The recovered material in the spoon sampler is described in the boring log as fragments of the particular rock encountered. However, when open excavations are made, it is found that the rock may be solid or massive and not fragmented.

Therefore, the description of the various strata contained in the test borings performed shall be used only as a guide in decisions regarding the rippability characteristics of the subsoil. Undisturbed samples of the subsoil or rock shall be obtained or even excavations shall be made, to more accurately evaluate the rippability characteristics of the underlying materials.

ROTARY DRILLING

At that depth at which further penetration is not feasible by the jetting and chopping process, advancement of the hole is obtained by making use of the rotary drilling method. This method is used to drill in consolidated or semi-consolidated materials. It consists as the name implies, of rotating a string of rods while continuous downward pressure is maintained through the rods on a tungsten carbide or diamond bit at the bottom of the hole. A number of different types of bits are used, most of which are capable of reducing stone or the most compact soil formations to small chips or particles. Water is forced down the rods to the bit and the return flow brings the cuttings to the surface. To drill into rock a core barrel is attached between the bit and the string of rods. The drilled rock enters into the core barrel while the stream of water is circulated through the rods and barrel to the bits, thus serving as a coolant. At intervals of about 2 to 5 feet, the barrel is brought to the surface, and the core is removed.

An estimate of the insitu rock quality can be obtained from the correlation provided by the rock quality designation (RQD). The rock quality designation (RQD) is defined as the percentage ratio between the total length of pieces of core, 4inch or longer, that are sound and hard and the length of core drilled on a given run.

The following table indicate the relation of RQD and in situ Rock Quality.

RQD (%)	Rock Quality
90-100	Excellent
75-90	Good
50-75	Fair
25-50	Poor
0-25	Very poor

LABORATORY WORK

Soil samples are classified according to their constituents, and the following terminology is used to denote the percentage by weight of each component:

Descriptive Term	Range of Proportion (%)
Trace	1-10
Some	10-20
Adjective (sandy, silty, clayey)	20-35
And	35-50

Granular soils are cohesionless soils consisting of boulders, gravel, sand, either separately or in combination.

Boulders are the constituents with average diameter larger than 3 inches. Gravel ranges from fine (No. 10 sieve) to coarse (3 inch sieve). Sand particles are those passing No. 10 sieve and retained on No. 200 mesh. The silt particles range from 0.06 mm to 0.002 mm.

Cohesive soils are those soils which possess the characteristics of cohesion and plasticity. They may be granular soils as described above with the addition of clay or organic silt which cause cohesion and plasticity or may be clay or organic silt with no coarse components.

The clay fraction is composed of clay minerals and in general has average particle diameter of less than 0.002 mm.

The organic silt fraction is that portion with average particle diameter less than 0.06 mm. The clay and organic silt may occur separately or in conjunction. Both materials will exhibit plastic qualities within a certain range of moisture content, but the range will be greater in the case of clay.

CARIBBEAN SOIL TESTING CO., INC.

SUBSURFACE EXPLORATION FIELD LOG

BORING NO. OW-1
SHEET 1 of 2
PROJECT NO. 83-4636

PROJECT PROPOSED DIGITAL EQUIPMENT CORPORATION GROUNDWATER MONITORING PROJECT AT SAN GERMAN, PUERTO RICO.

SAMPLER	DRILL MACHINE	DRILLER
1 3/8" I. D. Split Spoon	CME - 55	Juan Rosario

CASING SIZE	DEPTH CASED	DATE STARTED	DATE COMPLETED
3 1/4" H. S. Auger	36.2 ft.	4-12-83	4-13-83

CORE BARREL TYPE - Double Tube   SIZE - NWM   DEPTH DRILLED INTO ROCK 8.4 ft.

GROUNDWATER DEPTH	TOTAL DEPTH OF HOLE	INSPECTOR
Not found during drilling	44.6 ft.	ENG. M. POWERS

DEPTH IN FT.	STANDARD PENETRATION TEST "N" VALUE	BLOWS PER SIX INCHES ON SAMPLER 0-6	6-12	12-18	SAMPLE NUMBER	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL	NATURAL MOISTURE CONTENT %	UNCONFINED COMPRESSIVE STRENGTH T.S.F.	
	4	1	2	2	1	44%	Tannish brown silty clay, trace (-) sand, few roots.			
.5'										
	21	9	11	10	2	100%	Tannish brown sandy silt, trace (-) clay with black oxidation joints (secondary structures)			
9'	18	8	9	9	3	94%	Tannish brown to brown slightly consolidated clayey sandy silt.			
	45	11	22	23	4	83%				
	54	14	22	32	5	94%				
24'	97	22	39	58	6	83%	More consolidated with weathered rock fragments.			
8'	-	-	60/6"	-	7	100%	Greenish gray medium fine sand, some silt.			
33'	-	59	32	60/3"	8	87%	Tan weathered rock with brown silty sand and clay fines (saprolite)			
	-	-	60/5"	-	9	100%				
	ROCK RECOVERY = 75% R-1 RQD = 0						See below.			
.6'										

"N" VALUE IS THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLING SPOON
...STANCE OF TWELVE INCHES WITH A 140 L.B.S. HAMMER FALLING 30 IN.
...RAL MOISTURE CONTENT IS EXPRESSED IN PERCENTAGE OF ITS DRY WEIGHT

gcl

VERTICAL SCALE 1" = 6'-0"

CARIBBEAN SOIL TESTING CO., INC.

SUBSURFACE EXPLORATION FIELD LOG

BORING NO. OW-1
SHEET 2 of 2
PROJECT NO. 83-4636

PROJECT PROPOSED DIGITAL EQUIPMENT CORPORATION GROUNDWATER MONITORING PROJECT AT SAN GERMAN, PUERTO RICO.

DEPTH IN FT.	"N" VALUE	STANDARD PENETRATION TEST BLOWS PER SIX INCHES ON SAMPLER 0-6	6-12	12-18	SAMPLE NUMBER	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL	NATURAL MOISTURE CONTENT %	UNCONFINED COMPRESSIVE STRENGTH psf.
		ROCK RECOVERY = 42% RQD = 0			R-2		Brown closely fractured to moderately fractured with thin stains in joints, heavily weathered rock (possibly volcanic tuff)		
44.6'							END OF TEST HOLE 44'-7" Note: The bottom of the hole was sealed with bentonite pellets to a depth of 36.4 ft. thereafter a perforated PVC pipe tip with filter cloth was placed at the bottom of the hole. The 1 1/2" Ø PVC riser pipes were then installed to the top of the hole.		

gcl

CARIBBEAN SOIL TESTING CO., INC.

SUBSURFACE EXPLORATION FIELD LOG

BORING NO. OW-2
SHEET 1 of 1
PROJECT NO. 83-4636

PROJECT PROPOSED DIGITAL EQUIPMENT CORPORATION GROUNDWATER MONITORING PROJECT AT SAN GERMAN, PUERTO RICO.

SAMPLER	DRILL MACHINE	DRILLER
1 3/8" I. D. Split Spoon	CME - 55	Juan Rosario

CASING SIZE	DEPTH CASED	DATE STARTED	DATE COMPLETED
1/4" H. S. Auger	15.5 ft.	4-14-83	4-14-83

CORE BARREL
TYPE - Double Tube SIZE - NWM DEPTH DRILLED INTO ROCK 8.4 ft.

GROUNDWATER DEPTH	TOTAL DEPTH OF HOLE	INSPECTOR
17 inches during drilling	15.5 ft.	ENG. M. POWERS

DEPTH IN FT.	STANDARD PENETRATION TEST "N" VALUE	BLOWS PER SIX INCHES ON SAMPLER 0-6	6-12	12-18	SAMPLE NUMBER	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL	NATURAL MOISTURE CONTENT %	UNCONFINED COMPRESSIVE STRENGTH T.s.f.	
	65	24	30	35	1		Dark brown and gray clayey sandy silty and gravel (pavement base coarse).			
	9	10	5	4	2		Brown and brownish gray, gravelly sand.			
	15	7	7	8	3		Dark brown, medium coarse sand, few roots.			
5'	113	27	52	61	4		Brown to tannish brown clayey silt and gravel and weathered rock (consolidated).			
							END OF TEST HOLE 15.5 ft. Note: After retreival of auger water rose to 10", below surface. A 1-1/2" O. D. PVC observation well was installed. Tip located at 10.5 ft. The lower five feet of the hole was sealed with bentonite.			

...E IS THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLING SPOON ...ANCE OF TWELVE INCHES

gcl

VERTICAL SCALE

CARIBBEAN SOIL TESTING CO., INC.

SUBSURFACE EXPLORATION FIELD LOG

BORING NO. OW-2.1
SHEET 1 of 1
PROJECT NO. 83-4636

PROJECT PROPOSED DIGITAL EQUIPMENT CORPORATION GROUNDWATER MONITORING PROJECT AT SAN GERMAN, PUERTO RICO.

PLER	DRILL MACHINE	DRILLER
3/8" I. D. Split Spoon	CME - 55	Juan Rosario

CASING SIZE	DEPTH CASED	DATE STARTED	DATE COMPLETED
1/4" H. S. Auger	15.5 ft.	4-14-83	4-14-83

E BARREL TYPE - Double Tube SIZE - NWM DEPTH DRILLED INTO ROCK 8.4 ft.

UNDWATER DEPTH	TOTAL DEPTH OF HOLE	INSPECTOR
17 inches during drilling	15.5 ft.	ENG. M. POWERS

STANDARD PENETRATION TEST				SAMPLE NUMBER	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL	NATURAL MOISTURE CONTENT %	UNCONFINED COMPRESSIVE STRENGTH T.S.F.	REMARKS:
"N" VALUE	BLOWS PER SIX INCHES ON SAMPLER 0 - 6	6 - 12	12 - 18						
28	13	10	18	1	78%	Greenish gray and brown clayey silty sand, trace.			Groundwater was observed upon reaching 6.33 ft. upon completion of hole water level was recorded at 34.0 ft. Tip of observation well was installed at 35 feet. The lowermost 5 ft of hole were sealed with bentonite
12	6	7	5	2	72%				
18	5	6	12	3	100%	Brown silty clay, trace (-) sand (possibly fill).			
15	5	6	9	4	100%	Dark brown to dark gray clayey silt, trace pebbles, few roots.			
22	9	12	20	5	83%	Tan to tannish white clayey silt, trace (-) pebbles.			
18	5	8	10	6	100%				
25	10	11	14	7	100%	Tannish brown to tan sandy silt, some clay with secondary structures.			
57	16	25	32	8	94%	Brownish gray clayey sandy silt.			
75	-	35	40	9	78%				

...E IS THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLING SPOON ...ANCE OF TWELVE INCHES WITH A 140 L.B.S. HAMMER FALLING 30 IN.

END OF TEST HOLE 40.0 ft.

VERTICAL SCALE 1" = 6'-0"

CARIBBEAN SOIL TESTING CO., INC.

SUBSURFACE EXPLORATION FIELD LOG

BORING NO. OW-3
SHEET 1 of 1
PROJECT NO. 83-4636

PROJECT PROPOSED DIGITAL EQUIPMENT CORPORATION GROUNDWATER MONITORING PROJECT AT SAN GERMAN, PUERTO RICO.

SAMPLER	DRILL MACHINE	DRILLER
1 3/8" I. D. Split Spoon	CME - 55	Juan Rosario

CASING SIZE	DEPTH CASED	DATE STARTED	DATE COMPLETED
3 1/4" H. S. Auger	9.0 ft.	4-14-83	4-14-83

CORE BARREL TYPE - Double Tube SIZE - NWM DEPTH DRILLED INTO ROCK 8.4 ft.

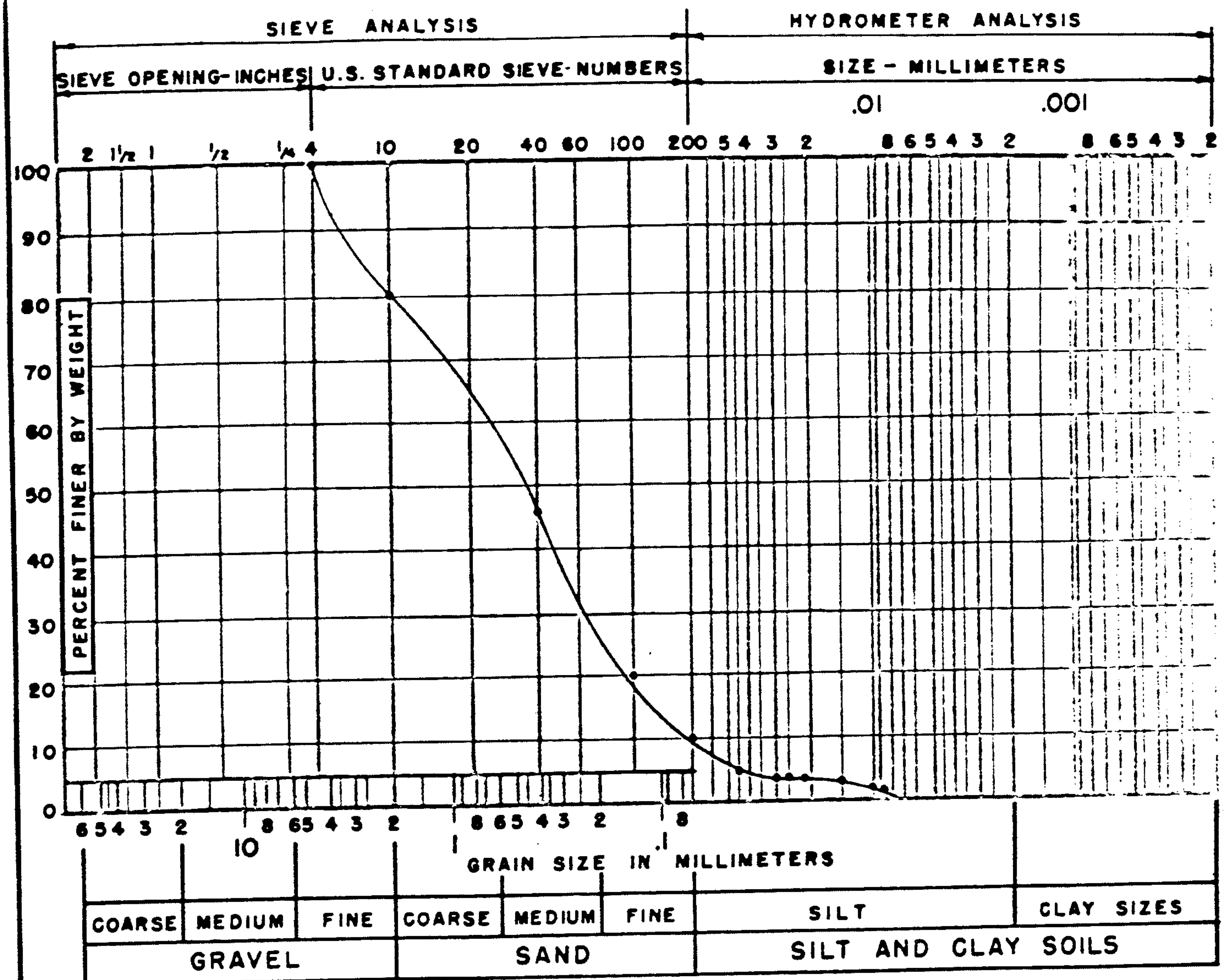
GROUNDWATER DEPTH	TOTAL DEPTH OF HOLE	INSPECTOR
Not found	9'-2"	ENG. M. POWERS

DEPTH IN FT.	STANDARD PENETRATION TEST "N" VALUE	BLOWS PER SIX INCHES ON SAMPLER 0-6	6-12	12-18	SAMPLE NUMBER	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL	NATURAL MOISTURE CONTENT %	UNCONFINED COMPRESSIVE STRENGTH T.S.F.
	35	12	21	14	1	33%	Brown and brownish gray clayey silt, some sand and gravel.		
3.5'	-	-	60/4"	-	2	100%	Gray to tannish gray clayey silt, and gravel possibly weathered rock.		
9.0'	-	-	60/2"	-	3	0			
							END OF TEST HOLE 9'-2"		
							Note: 1-1/2" Ø PVC observation well installed, which tip was placed at 7.0 ft. Actual location of test hole was 10 ft. separated from original location since underground water pipe was hit, for which drilling was discontinued at original location by inspector. The lowermost 2 ft of the hole was sealed with bentonite.		

"N" VALUE IS THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLING SPOON A DISTANCE OF TWELVE INCHES WITH A 140 L.B.S. HAMMER FALLING 30 IN

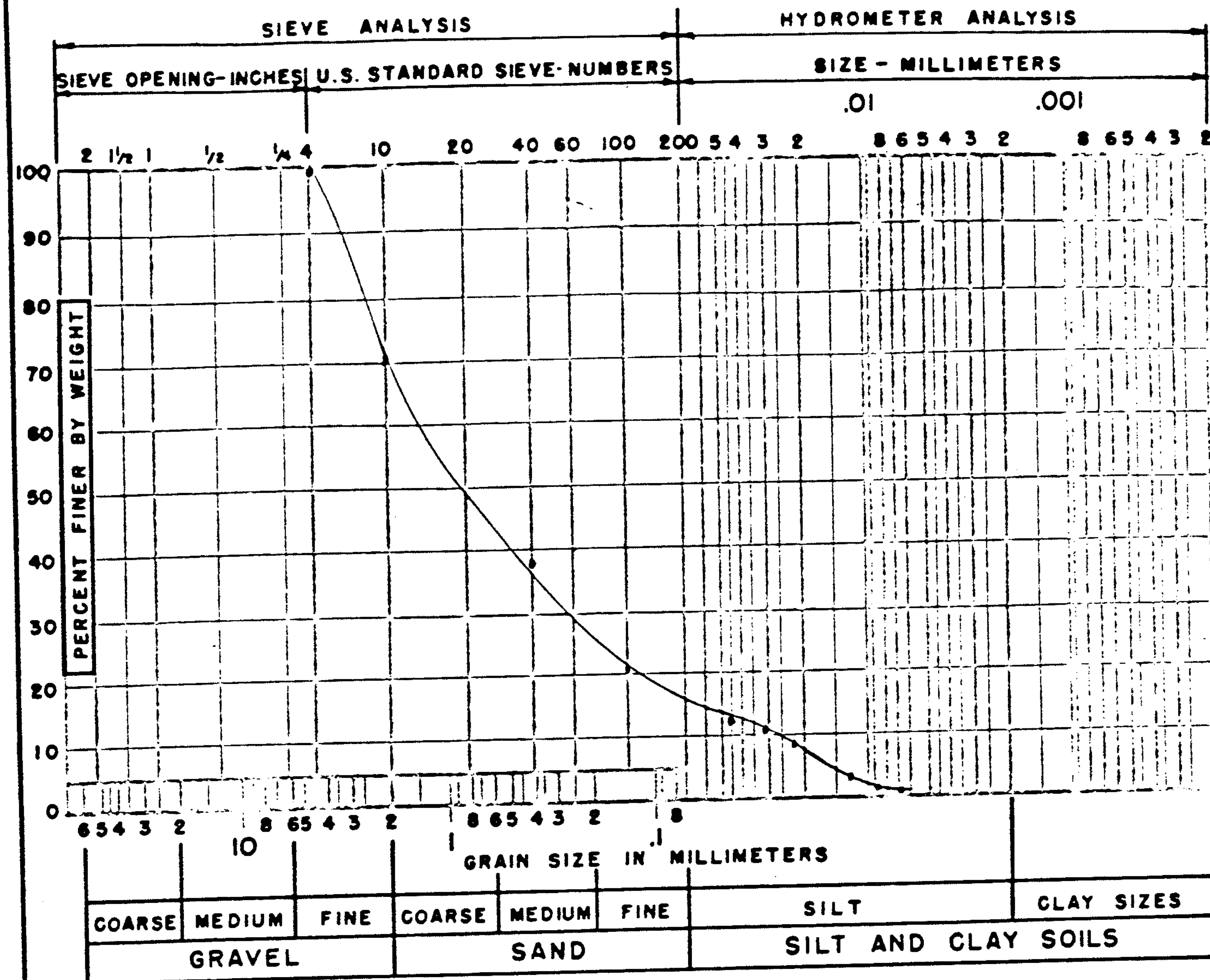
gcl

VERTICAL SCA



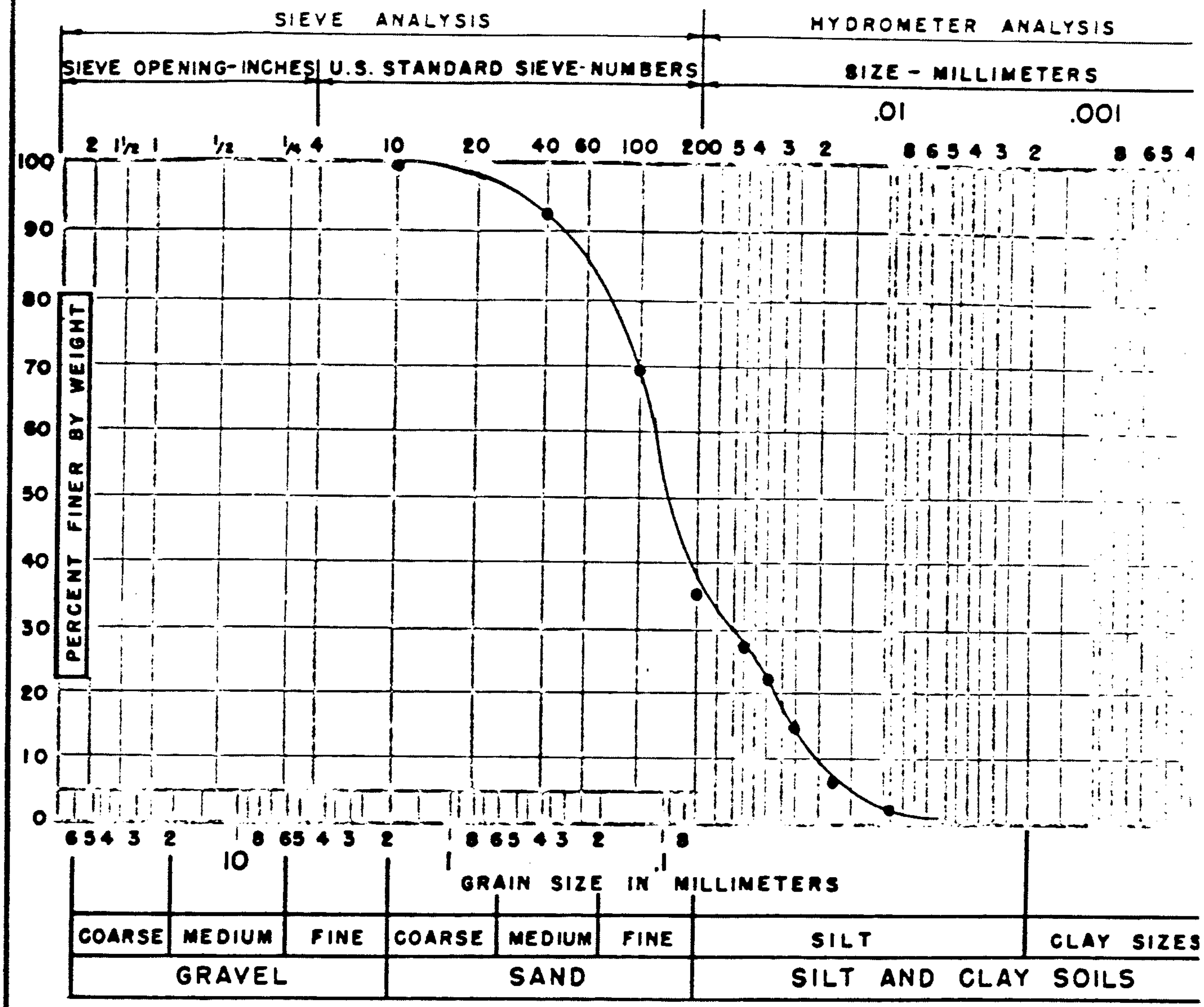
CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
1		OWI	19'-20'	N.A.	N.A.	N.A.	Tannish brown medium coarse sand trace (-) silt.

DIGITAL EQUIPMENT CORPORATION	CARIBBEAN SOIL TESTING CO., INC. Consulting Engineers, Rio Piedras, P.R.		
SAN GERMAN, P.R.	GRAIN SIZE DISTRIBUTION	BY:	DATE:
		DWG.	



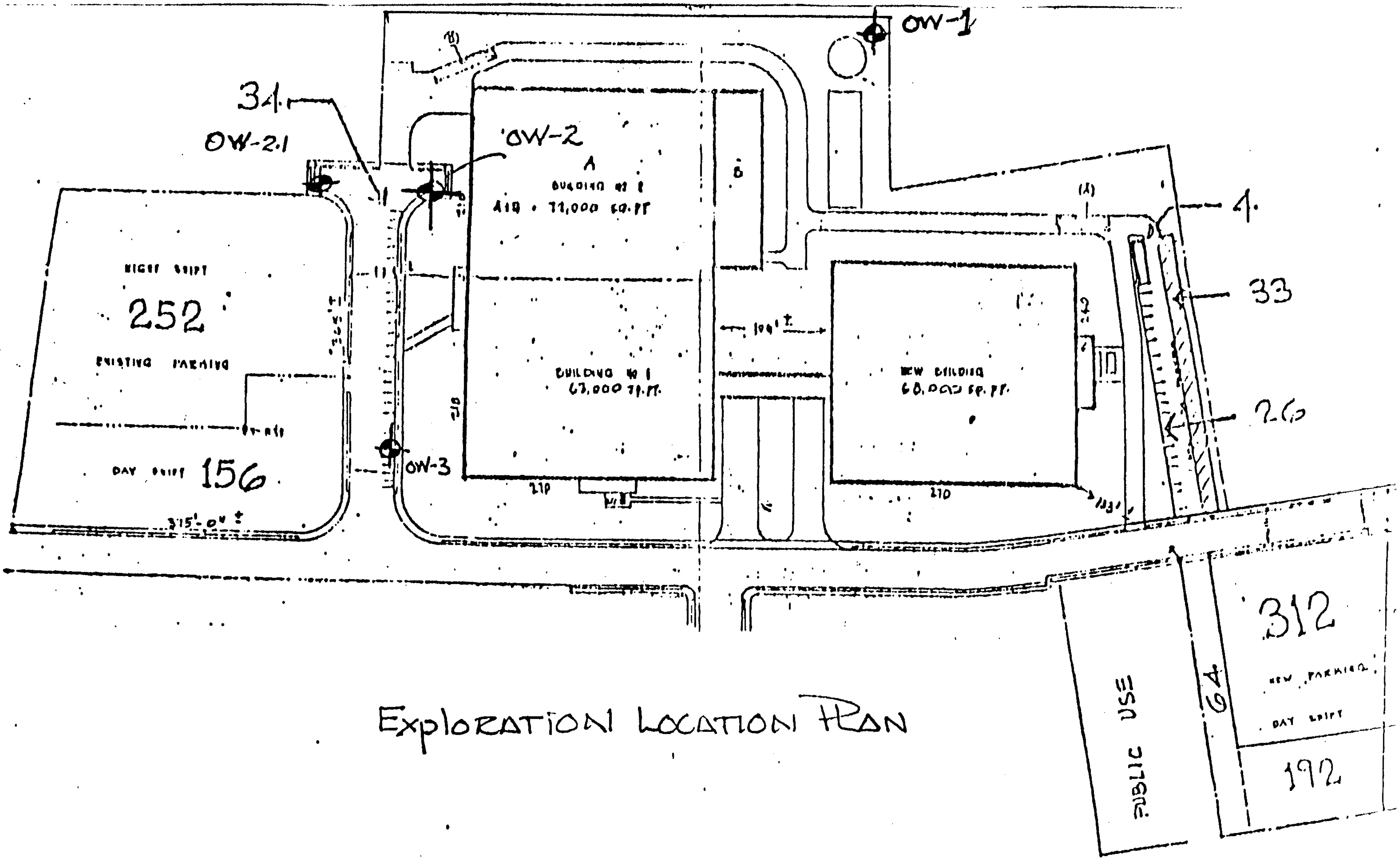
CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
2		OW1	24'-25'	NA	NA	NA	Tannish brown medium coarse sand, trace silt.

DIGITAL EQUIPMENT CORPORATION	CARIBBEAN SOIL TESTING CO., INC. Consulting Engineers, Rio Piedras, P.R.
SAN GERMAN, P.R.	GRAIN SIZE DISTRIBUTION — BY: — DATE: — DWG.



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
3		OW1	29'-29.5'	NA	NA	NA	Greenish gray medium fine sand, some silt

DIGITAL EQUIPMENT CORPORATION	CARIBBEAN SOIL TESTING CO., INC. Consulting Engineers, Rio Piedras, P.R
SAN GERMAN, P.R.	GRAIN SIZE DISTRIBUTION
BY:	DATE:
DWG.	



EXPLORATION LOCATION PLAN

PARKING FACILITIES

APPENDIX C

BORING LOGS
GOLDBERG-ZOINO & ASSOCIATES, INC.

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Geohydrologic Study
DEC San German Facility

REPORT OF BORING No. GW-101
SHEET 1 OF 2
FILE No. A-3675.2
CHKD. BY

BORING Co. GEOTEC
FOREMAN Nicholas Andino
GZA ENGINEER E. Steinberg/dlw

BORING LOCATION See plan (1)
GROUND SURFACE ELEVATION 328.4' DATUM Assumed B.M.
DATE START 7/13/83 7/14/83 DATE END 7/14/83 (Borehole) 7/22/83 (Observ. Well)

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING 300lb. HAMMER FALLING 24 in.
2-1/4" I.D. x 6" O.D.
CASING SIZE: Hollow Stem Auger OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/14/83	7:00	11'	16'	15 hours (A)
7/14/83	10:30	6'	OUT	2.0 hours (7)
7/21/83	08:00	8.7'	WELL	30 hours (9)
7/31/83	07:30	10'	WELL	12½ days

DEPTH (ft)	CASING (bl/ft)	No.	PEN. (in)/REC	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
		S-1	24/7	0-2	4-5-7-5	Medium dense, green-gray, fine to coarse GRAVEL, some fine to coarse Sand, little Clayey Silt.	(A)	
		S-2	24/14	2-4	10-10-7-6	Same as S-1.	(A)	MEDIUM DENSE GRANULAR FILL
5		S-3	24/16	4-6	25-14-13-15	Similar to S-1 except little, fine to coarse SAND.	(A)	6.0'
		S-4	24/18	6.2-8.2	10-6-10-10	Very stiff, green-gray grading to orange-brown SILT and CLAY, little fine to coarse Gravel (@ mid-sample), trace fine to coarse Sand.	2 (A)	
		S-5	24/18	8.2-9.7	4-8-15-8	Very stiff, green-gray mottled orange-brown SILT and CLAY, little fine to coarse Gravel, little fine to coarse Sand.	(A)	STIFF TO VERY STIFF CLAYEY FILL
10		S-5A	/4	9.7-10.2		Orange-brown, CLAY and SILT, trace fine to coarse Sand.	(A)	
		S-6	21/8	10.2-11.5	2/3"-4-5-7	Same as S-5A, stiff.	(A)	
		S-6A	/6	11.5-12		Similar to S-5A except dark brown, organic odor.		
		S-7	24/6	12-12.5	5-10-9-16	Same as S-6A.	3	
		S-7A	/9	12.5-13.5		Light orange-brown, mottled gray-brown SILT and CLAY, some fine to coarse Sand, trace fine Gravel.	4 (A)	
		S-7B	/3	13.5-14		Dark gray SILT and CLAY, some fine to medium Sand, with 1/4" thick layer orange-brown Clay and Silt.	5 (A)	
15		S-8	24/11	14-16	7-11-11-13	Green-gray mixed with dark brown SILT and CLAY, little fine to coarse Sand, little fine to coarse Gravel.	6 (A)	16.0'
								STIFF TO VERY STIFF NATURAL CLAYEY SILT

(see next sheet)

GRANULAR SOILS BLOWS/FT.	DENSITY	COHESIVE SOILS BLOWS/FT.	DENSITY
0-4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS:
1. Location selected with regard to results of GW-2.1 and low topographic area prior to construction.
2. Driller notes water at approximately 7' depth.
3. No sample retained.
4. Granular fraction appears to be decomposed rock.
5. Appears to be weathered rock.
(A) Sample submitted for lab chemical analysis.

GZA NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

BORING No. GW-101

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.

GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Geohydrologic Study
DEC San German Facility

REPORT OF BORING No. GW-101
SHEET 2 OF 2
FILE No. A-3675.2
CHKD. BY

DEPTH (ft.)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
15						(See preceding sheet)	8	STIFF TO VERY STIFF CLAYEY FILL 16.0'
		S-9	24/10	16-17	4-8-10-12	Stiff, dark brown, Clayey SILT, trace Organic Fibers, organic odor; changes at 17'.	(A)	STIFF TO VERY STIFF NATURAL SANDY SILT AND CLAY
		S-9A	19	17-18		Orange-brown, mottled dark brown SILT and CLAY, some fine to medium Sand, trace fine Gravel	(A)	
		S-10	24/18	18-20	4-6-8-9	Stiff, orange-brown, mottled gray and dark brown CLAY and SILT, little fine to medium Sand.	(A)	20.0'
20								Bottom of Exploration at 2(

REMARKS:
6. Sample contains brick-colored flecks.
7. Water level rose to 6' depth following withdrawal of auger.
8. 2" PVC observation well installed with tip at 16' - see attached sheet
9. Water found to be clay slurry, bail well to 15.5' level.

GZA

BORING No. GW-101

WELL No. OW-101
BORING No. OW-101
FILE No. A-3675.2

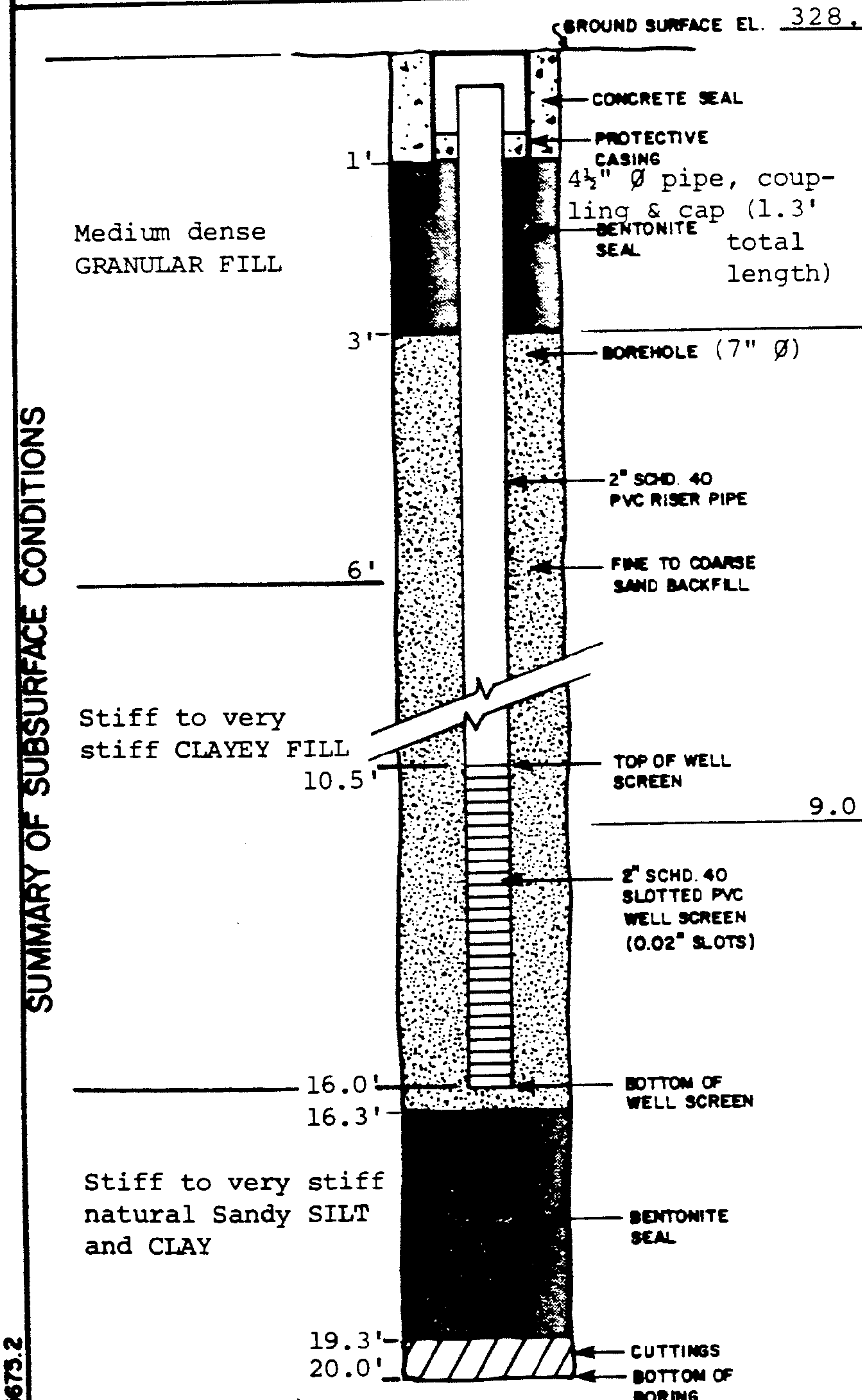
DATE INSTALLED 14 July '83 to 22 July '83

PROJECT DEC Geohydrologic Study | LOCATION San German, P.R.

GZA ENGINEER E. Steinberg | CONTRACTOR Geotec

WEATHER CONDITIONS Sunny 90°F | DRILLER Nicholas Anding

REMARKS See Boring Log OW-101



REMARKS

Protective casing and concrete installed 7/22/83

Upper Bentonite seal installed 7/20/83

Limit of Sand backfill 7/19/83 (borehole overfilled to 2' depth and re-excavated to 3' depth)

Limit of backfill 7/18/83 (ran out of sand)

Installation of seal attempted 7/14/83. However, bentonite improperly tamped, plugging lower 10'± of borehole-hole subsequently reamed to 7" Ø and flushed with water-seal installed 7/18/83

NOTE: NOT TO SCALE

FILE No. A-3675.2

GZA

DEPTH / ELEV. BOTTOM OF BORING 20 / 308.4

DEPTH / ELEV. BOTTOM OF WELL POINT 16 / 312.4

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.

GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT: Geohydrologic Study, DEC San German Facility

REPORT OF BORING NO. GW-102
SHEET 1 OF 3
FILE No. A-3675.2
CHKD. BY

BORING Co. GEOTEC
FOREMAN Nicholas Andino
GZA ENGINEER E. Steinberg/dlw

BORING LOCATION See plan (1)
GROUND SURFACE ELEVATION 329.1' DATUM Assumed B.M.
DATE START 7/14/83, 7/20/83 DATE END 7/19/83 (borehole), 7/22/83 (well)

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING 300 lb. HAMMER FALLING 24 in. 2-¼" I.D.x 6" O.D.

CASING SIZE: Hollow Stem Auger OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/20	16:00	33.3	WELL	INSTALLATION
7/21	07:00	33.8	WELL	15 hours (A)
7/31	07:30	34.0	WELL	10½ days

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
						Bituminous Pavement, 3" thick.		BITUMINOUS PAVEMENT 0.3'
		S-1	24/14	0-2	32-19-9-7	Dense, green-gray, fine to coarse GRAVEL, some fine to coarse Sand, some Clayey Silt.	(A)	DENSE GRANULAR FILL 2.0'
		S-2	24/13	2-4	6-4-5-5	Stiff, green-gray SILT and CLAY, some fine to coarse Gravel, little fine to coarse Sand.	(A)	
5		S-3	24/19	4-6	4-4-11-13	Stiff, green-gray CLAY and SILT, little+ fine to coarse Gravel, trace+ fine to coarse Sand with 4" layer at mid-sample: orange-brown Clay and Silt, trace fine to coarse Sand.	(A)	STIFF CLAYEY FILL
		S-4	24/20	6-7	7-8-6-5	Stiff, orange-brown CLAY and SILT, trace fine Gravel, trace fine to coarse Sand.	(A)	
		S-4A		7-8		Stiff, green-gray CLAY and SILT and fine to coarse GRAVEL, little fine to coarse Sand.	(A)	
		S-5	24/19	8-10	3-6-9-9	Stiff, orange-brown mixed with green-gray CLAY and SILT, little fine to coarse Gravel, trace fine to coarse Sand.	(A)	
10		S-6	24/21	10-12	3-4-4-7	Medium stiff, orange-brown mixed with brown Silty CLAY, trace fine Gravel, trace fine to medium Sand.	(A)	12.0'
		S-7	24/20	12-14	3-6-8-10	Stiff, dark brown Clayey SILT, trace fine Gravel, trace fine to coarse Sand, organic fibers, organic odor.	(A)	
15		S-8	24/12	14-15.5	6-7-11-13	Very stiff, dark brown SILT and CLAY, trace fine Sand, organic fiber, organic odor; lower 6" of sample grading to	(A)	STIFF TO VERY STIFF NATURAL CLAYEY SILT/ SILT AND CLAY
		S-8A	/6	15.5-16		Dark brown, mottled orange-brown SILT and CLAY, little fine to medium Sand, trace fine Gravel.	(A)	

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT.	DENSITY
0-4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS:
1. Location selected with regard to GW-2.1 and preliminary proposed grid.
(A) Sample submitted for lab chemical analysis.

GZA

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

BORING No. GW-102

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Geohydrologic Study
DEC San German Facility

REPORT OF BORING No. GW-102
SHEET 2 OF 3
FILE No. A-3675.2
CHKD. BY

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
		S-9	24/19	16-18	6-6-8-10	Stiff, orange-brown marbled with dark brown CLAY and SILT; contains zones comprising 10 to 20% of sample, fine to coarse Gravel and fine to coarse Sand (appears to be decomposed rock).	(A)	STIFF TO VERY STIFF NATURAL CLAYEY SILT/ SILTY CLAY (DECOMPOSED ROCK)
		S-10	24/17	18-20	3-5-6-8	Stiff, orange-brown mottled white Clayey SILT, little fine Sand (appears to be decomposed rock).	(A)	
20								
		S-11	24/20	20-22	3-5-6-7	Stiff, orange-brown mottled white SILT and CLAY, little fine Sand (appears to be decomposed rock).	(A)	
		S-12	24/19	22-24	3-6-8-13	Stiff, orange-brown mottled white Clayey SILT, some fine Sand (decomposed rock).	(A)	
25		S-13	24/18	24-26	5-8-13-17	Similar to S-12 except very stiff.	(A)	
		S-14	24/21	26-28	9-11-14-16	Similar to S-12 except very stiff.	(A)	
		S-15	24/24	28-30	8-12-19-20	Hard, orange-gray-brown mottled white SILT, some fine Sand, (decomposed rock).	(A)	HARD SANDY SILT (DECOMPOSED ROCK)
30								
		S-16	24/21	30-32	13-21-25-29	Hard, orange-gray-brown mottled white SILT, some fine Sand (decomposed rock with original structure and rust stains apparent)	(A)	
		S-17	24/24	32-34	9-17-25-36	Same as S-16.	(A)	

REMARKS:

GZA

BORING No. GW-102

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Geohydrologic Study
DEC San German Facility

REPORT OF BORING No. GW-102
SHEET 3 OF 3
FILE No. A-3675.2
CHKD. BY

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
35		S-18	24/19	34-36	11-16-20-25	Hard, orange-gray-brown mottled white SILT, some fine Sand (decomposed rock with original structure and rust stains apparent)	(A) 3	HARD SANDY SILT (DECOMPOSED ROCK)
		S-19	24/20	36-38	15-19-30-43	Same as S-18.	2 4 (A)	
		S-20	24/14	38-40	18-27-48-85	Same as S-18.	(A)	
40								Bottom of Exploration at 40'

REMARKS:
2. Water detected at 37.5' (measured with plunker inside augers).
3. Water detected at 34.5' upon withdrawing augers.
4. Observation well (2" ϕ PVC) installed with tip at 37.7' - see attached sheet.

GZA

BORING No. GW-102

WELL No. OW-102
BORING No. OW-102
FILE No. A-3675.2

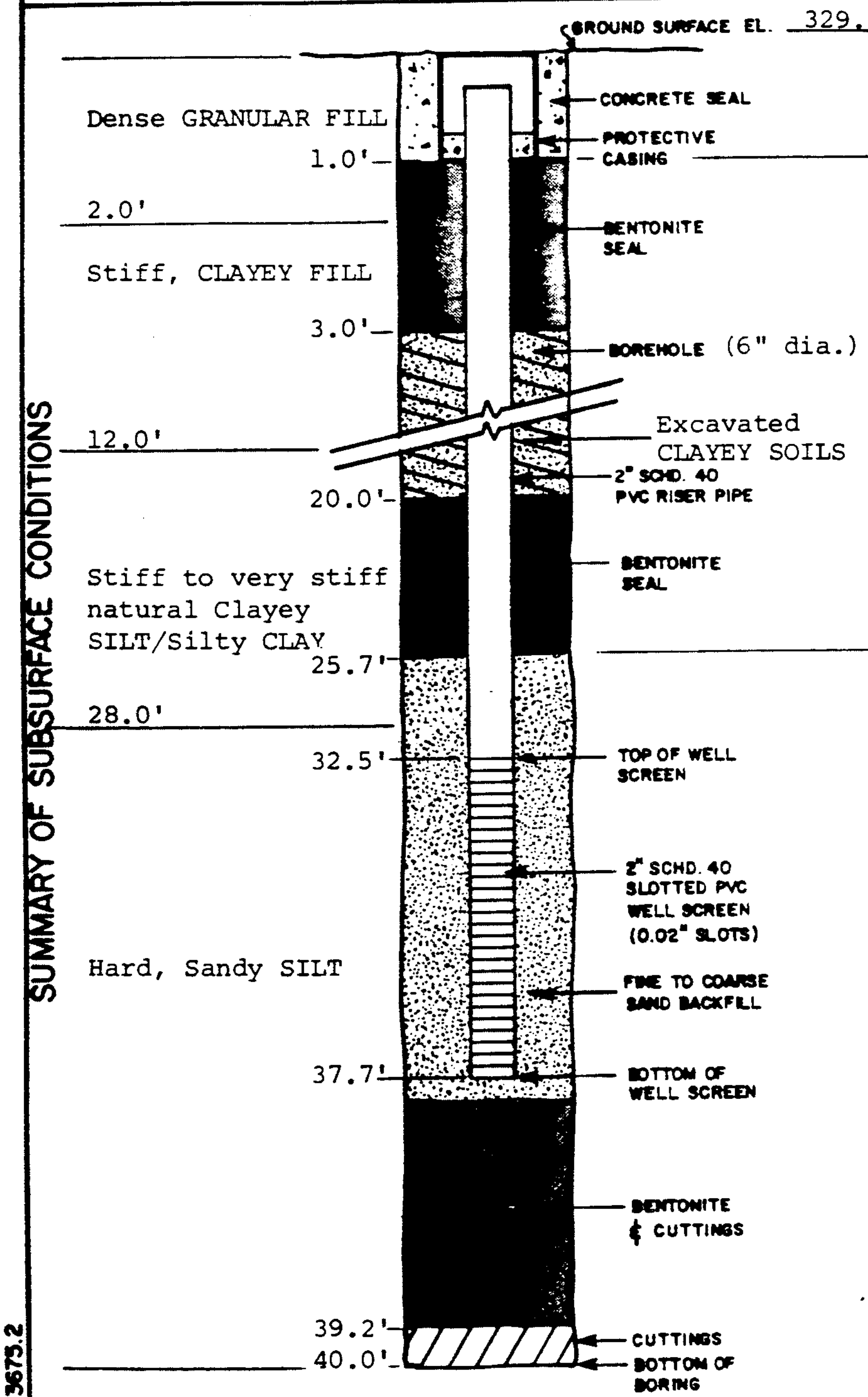
DATE INSTALLED 7/20/83 to 7/22/83

PROJECT DEC Geohydrologic Study — LOCATION San German, P.R.

GZA ENGINEER E. Steinberg — CONTRACTOR Geotec

WEATHER CONDITIONS Sunny, 90°F — DRILLER Nicholas Andinó

REMARKS See Boring Log OW-102



REMARKS

Protective casing and concrete seal installed 7/22/83

Limit of backfill 7/21/83

Limit of backfill 7/20/83

7/20/83: Installation of bentonite seal attempted; Bentonite apparently bridged at G.W.T. (34.5' upon withdrawing augers) up to 33'. Bentonite "pushed" to 39' depth with 3" dia. tamping tool; borehole reaugered to 37.5 depth, underlying materials left in-place

NOTE: NOT TO SCALE

FILE No. A-3675.2

GZA

DEPTH/ELEV. BOTTOM OF BORING 40 /289.1

DEPTH/ELEV. BOTTOM OF WELL POINT 37.7/291.4

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Geohydrologic Study
DEC San German Facility

REPORT OF BORING No. OW-103
SHEET 1 OF 1
FILE No. A-3675.2
CHKD. BY

BORING Co. GEOTEC
FOREMAN Nicholas Andino
GZA ENGINEER E Steinberg/dlw

BORING LOCATION
GROUND SURFACE ELEVATION 329.1' DATUM Assumed B.M.
DATE START 7/19/83 7/20/83 DATE END 7/20/83 (borehole) 7/22/83 (well)

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING 300 lb. HAMMER FALLING 24 in.
3-½" I.D. x 7" O.D.
CASING SIZE: Hollow Stem Auger OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/21	09:30	NONE	WELL	24 hours
7/26	18:30	7.5	WELL	~6 days (A)
7/31	09:00	5.1	WELL	10 Days

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
						Bituminous Pavement, 1" thick.		BITUMINOUS PAVEMENT 0.1'
		S-1	24/19	0-2	11-12-8-11	Very stiff, green-gray, Clayey SILT and fine to coarse GRAVEL, little fine to coarse Sand.	(A)	
		S-2	24/21	2-4	5-8-10-16	Very stiff, green-gray mixed with orange-brown SILT and CLAY, some fine to coarse Gravel, little fine to coarse Sand.	(A)	STIFF TO VERY STIFF CLAYEY FILL
5		S-3	24/22	4-6	10-9-8-7	Very stiff, orange-brown mixed with green-gray SILT and CLAY, some fine to coarse Gravel, some fine to coarse Sand.	(A)	
		S-4	24/17	6-8	6-14-10-10	Very stiff, orange-brown mixed with green-gray and grading to dark brown at tip, CLAY and SILT, little fine to coarse Gravel, trace Silt.	(A)	
		S-5	24/22	8-10	4-6-8-11	Stiff, gray-brown mixed with dark brown and orange-brown CLAY and SILT, little-fine to coarse Gravel, trace Silt.	(A)	
10		S-6	24/19	10-12	4-7-7-10	Stiff, dark gray-brown SILT and CLAY, trace fine Gravel, trace fine to coarse Sand; grading to dark brown Clayey Silt, trace fine to coarse Sand.	(A) 1	12.5'
		S-7	24/4	12-12.5	6-8-13-14	Stiff, dark gray-brown mixed with orange-brown SILT and CLAY, trace fine Gravel, trace fine to coarse Sand; changing at 12.5 to	(A)	STIFF, NATURAL SILT AND CLAY
		S-7A	/15	12.5-14		Dark brown grading to orange-brown mottled dark brown SILT and CLAY, trace fine Sand.	(A)	
15		S-8	24/22	14-16	5-7-8-12	Stiff, orange-brown mottled dark brown and white, grading to green-gray mottled orange-brown SILT and CLAY, little fine Sand, trace fine Gravel.	(A)	16.0' Bottom of Exploration at 16.0'

GRANULAR SOILS BLOWS/FT.	DENSITY	COHESIVE SOILS BLOWS/FT.	DENSITY
0-4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS:
1. Observation well (2" ϕPVC) installed with tip at 11.8', see attached sheet.
(A) Sample submitted for lab analysis.

GZA

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

BORING No. OW-103

WELL No. OW-103
BORING No. OW-103
FILE No. A-3675.2

DATE INSTALLED 7/20/83 to 7/22/83

PROJECT DEC Geohydrologic Study

LOCATION San German, P.R.

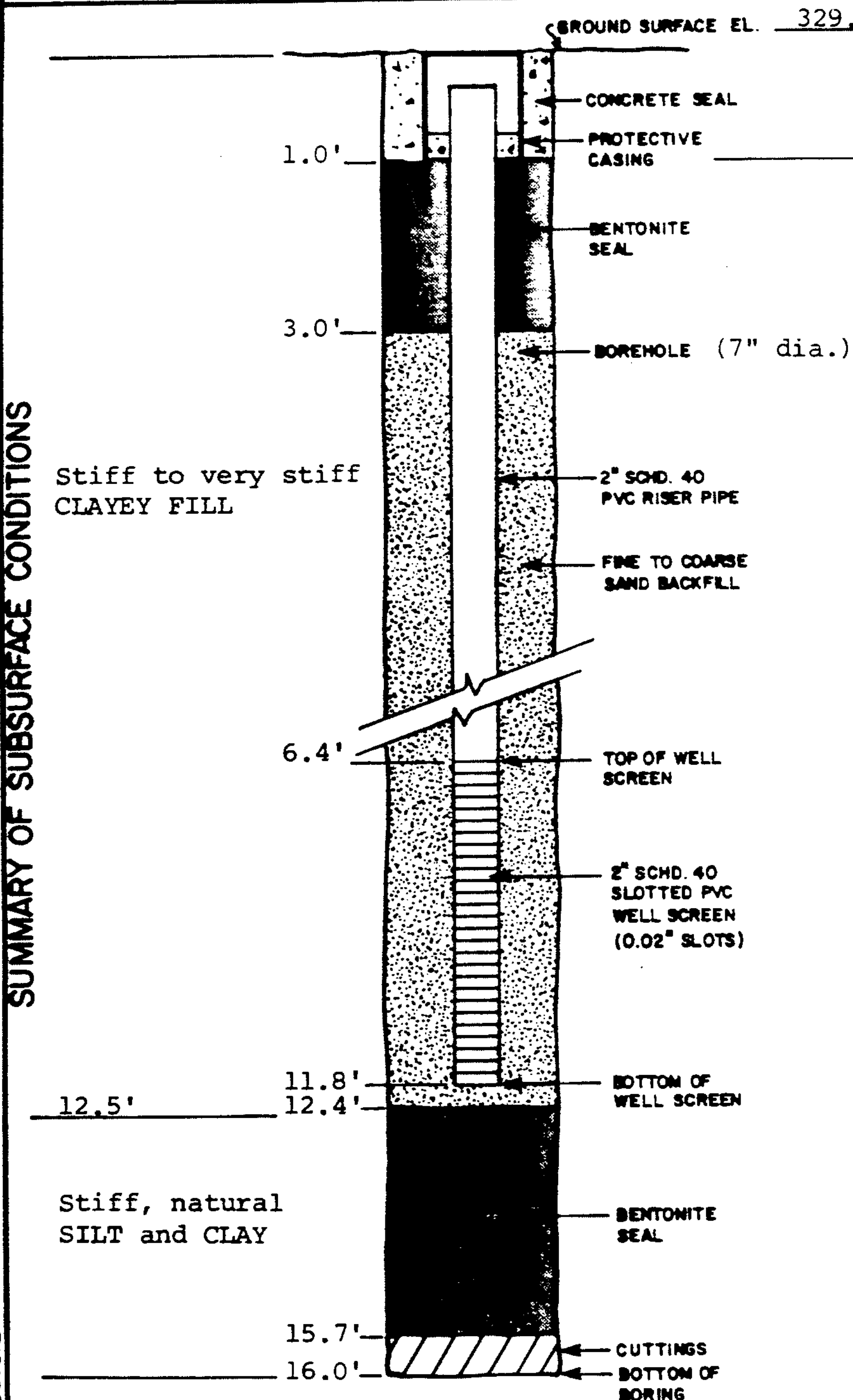
GZA ENGINEER E. Steinberg

CONTRACTOR Geotec

WEATHER CONDITIONS Sunny, 90°F

DRILLER Nicholas Andino

REMARKS See Boring Log OW-103



REMARKS

Protective casing and concrete installed 7/22/83

Limit of backfill 7/20/83

Borehole dry during well installation, to create bentonite seal add approximately 1 part water: 2 parts bentonite

NOTE: NOT TO SCALE

FILE No. A-3675.2

GZA

DEPTH / ELEV. BOTTOM OF BORING 16 / 313.0

DEPTH / ELEV. BOTTOM OF WELL POINT 11.8 / 317.2

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.

GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT

Geohydrologic Study
DEC San German Facility

REPORT OF BORING No. OW-104
SHEET 1 OF 2
FILE No. A-3675.2
CHKD. BY

BORING Co. GEOTEC
FOREMAN Nicholas Andino
GZA ENGINEER E. Steinberg/dlw

BORING LOCATION See plan (1)
GROUND SURFACE ELEVATION 329.0' DATUM Assumed B.M.
DATE START 7/21/83 7/22/83 DATE END 7/21/83 (borehole) 7/26/83 (well)

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING 300 lb. HAMMER FALLING 24 in.
2-¼" I.D. x 6" O.D.
CASING SIZE: Hollow Stem Auger OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/22	09:30	NONE	OUT	18 hours
7/27	08:30	12'	WELL	5 days (A)
7/31	07:30	11.8'	WELL	9 days

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
		S-1	24/12	0-2	8-9-6-4	Stiff, green-gray SILT and CLAY and fine to coarse Gravel, trace+ fine to coarse Sand.	(A)	
		S-2	24/20	2-4	5-5-13-14	Very stiff, green-gray mixed with orange-brown CLAY and SILT and fine to coarse Gravel, little fine to coarse Sand.	(A)	STIFF TO VERY STIFF CLAYEY FILL
5		S-3	24/19	4-6	7-7-11-11	Same as S-2.	(A)	
		S-4	24/12	6-8	7-7-6-9	Stiff, orange-brown CLAY and SILT, trace fine to coarse Sand.	(A)	
		S-5	24/22	8-10	2-9-9-9	Very stiff, orange-brown mixed with green-gray SILT and CLAY, some- fine to coarse Sand, trace fine Gravel.	(A)	
10								
		S-6	24/4	10-10.5	4-7-11-10	Similar to S-5; changing at 10.5' to	(A)	
		S-6A	/12	10.5-11.5		Very stiff, dark brown SILT and CLAY, trace fine Gravel, trace fine to coarse Sand; changing at 11.5' to	(A)	
		S-6B	/5	11.5-12		orange-brown, mottled green-gray CLAY and SILT, little fine Sand, trace fine Gravel.	(A)	
		S-7	24/17	12-13.5	6-10-11-9	S-7: Med. dense, orange-brown, fine to medium SAND, some Silt with 2" zone Silt and Clay at top sample; and 2" zone at bottom sample containing 35-50% fine to coarse Gravel, 10-20% Clay and Silt; changing at 13.5' to	(A)	13.5'
		S-7A	/4	13.5-14				STIFF, NATURAL CLAY AND SILT
15						Dark brown Clayey SILT, trace fine to coarse Sand, trace fine Gravel, organic fibers, organic odor.	(A)	16.0'

GRANULAR SOILS BLOWS/FT.	DENSITY	COHESIVE SOILS BLOWS/FT.	DENSITY
0-4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS:
1. Location chosen with regard to OW-103 (no water and clean), OW-2.
2. Observation well installed (2" PVC) with tip at 15' (see attached sheet).
(A) Sample submitted for lab analysis.

GZA NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

BORING No. OW-104

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Geohydrologic Study
DEC San German Facility

REPORT OF BORING No GW-104
SHEET 2 OF 2
FILE No. A-3675.2
CHKD. BY

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
								STIFF, NATURAL CLAY AND SILT
15		S-8	24/22	14-16	3-3-5-6	Stiff, orange-brown mottled gray CLAY and SILT, trace fine to coarse Sand, organic fibers.	(A) 2	16.0'
		S-9	24/20	16-18	4-6-9-10	Stiff, gray-brown mottled gray and light brown SILT, some fine Sand with inclusions gray Clay and Silt comprising less than 10% of sample.	(A)	STIFF TO VERY STIFF SILT
		S-10	24/23	18-20	9-17-23-25	Very stiff, gray-brown layered with orange-brown SILT, little fine Sand.	(A)	
20								Bottom of Exploration at 20.

REMARKS:

GZA

BORING No. GW-104

WELL No. OW-104
BORING No. OW-104
FILE No. A-3675.2

DATE INSTALLED 7/22/83 to 7/26/83

PROJECT DEC Geohydrologic Study

LOCATION San German, P.R.

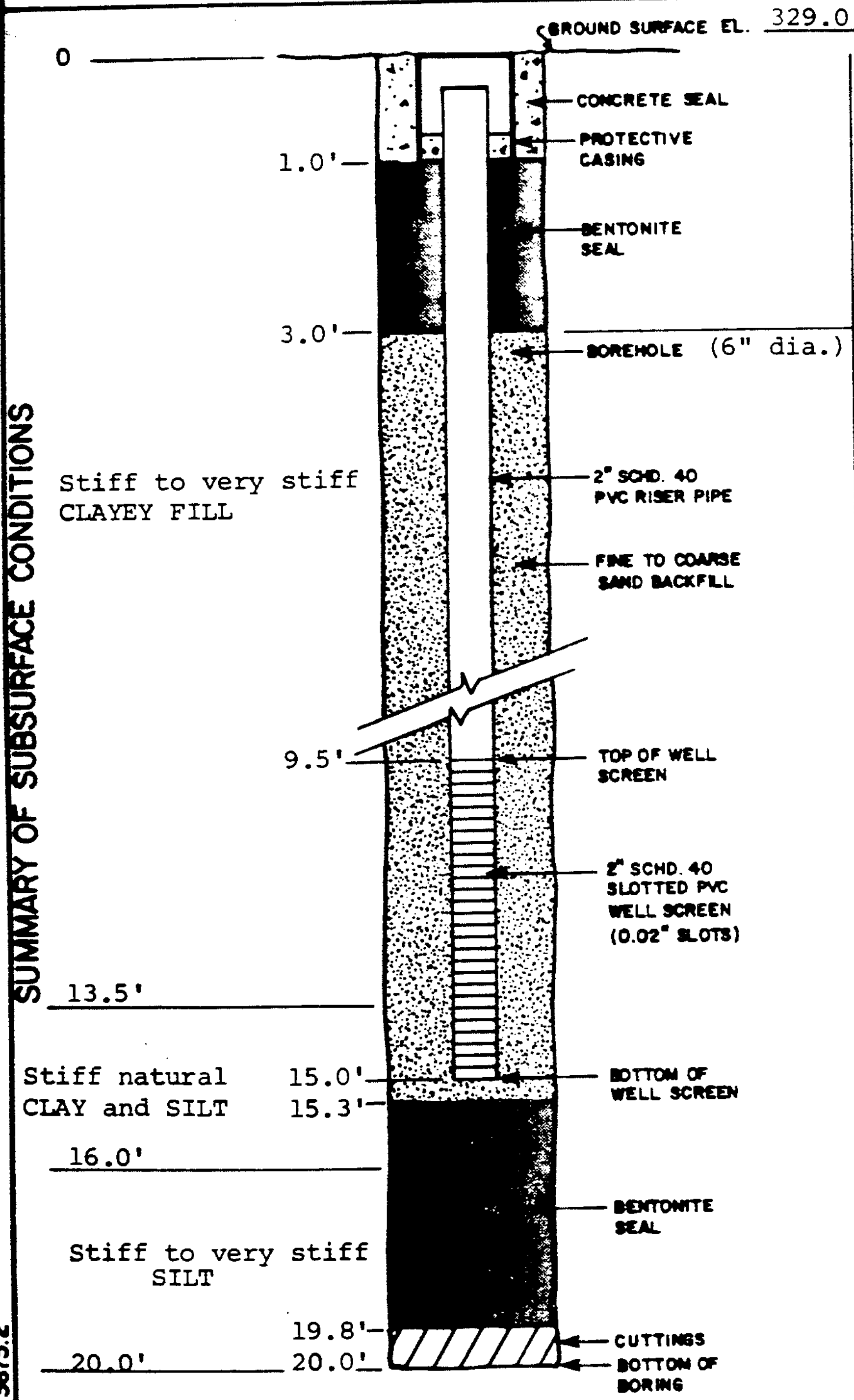
GZA ENGINEER E. Steinberg

CONTRACTOR Geotec

WEATHER CONDITIONS Sunny 90°F

DRILLER Nicholas Andino

REMARKS See Boring Log OW-104



REMARKS

Upper Bentonite seal, protective casing and concrete installed 7/26/83

Limit of backfill 7/22/83 (ran out of Bentonite)

Borehole dry during well installation; to create Bentonite seal add approximately 1 part water: 2 parts Bentonite

NOTE: NOT TO SCALE

FILE No. A-3675.2

GZA

DEPTH/ELEV. BOTTOM OF BORING 20 / 309.0

DEPTH/ELEV. BOTTOM OF WELL POINT 15 / 314.0

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Geohydrologic Study
DEC San German Facility

REPORT OF BORING No. OW-105
SHEET 1 OF 2
FILE No. A-3675.2
CHKD. BY

BORING Co. GEOTEC
FOREMAN Nicholas Andino
GZA ENGINEER E. Steinberg

BORING LOCATION See plan (1)
GROUND SURFACE ELEVATION 328.7' DATUM Assumed B.M.
DATE START 7/21/83 7/26/83 DATE END 7/22/83 (borehole) 7/27/83 (well)

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING 300 lb. HAMMER FALLING 24 in. 3-¼" I.D. x 7" O.D.
CASING SIZE: Hollow Stem Auger OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/28	08:00	4.6	WELL	20 hours (A) (2)
7/29	09:00	4.6	WELL	~2 days (2)
7/31	07:30	4.5	WELL	~4 days

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
						Bituminous Pavement, 2" thick.		0.2' BITUMINOUS PAVEMENT
		S-1	24/12	0-2	11-10-12-21	Dense, brown and gray-brown, fine to coarse SAND, some fine to coarse Gravel, some Silt and Clay.	(A)	DENSE GRANULAR FILL
		S-2	24/7	2-3	6-6-3-4	Stiff, green-gray SILT and CLAY, some fine to coarse Gravel, little fine to coarse Sand, changing at 3' to	(A)	STIFF TO VERY STIFF CLAYEY FILL
		S-2A	/7	3-4		Orange-brown SILT and CLAY, trace fine Gravel, trace fine to coarse Sand.	(A)	
5		S-3	24/19	4-6	6-6-7-9	Stiff, green-gray grading to orange-brown with depth SILT and CLAY, some fine to coarse Gravel, little fine to coarse Sand.	(A)	
		S-4	24/24	6-8	4-6-14-11	Very stiff, orange-brown CLAY and SILT, trace fine to coarse Gravel, trace fine to coarse Sand; with 8" layer near bottom sample: green-gray, fine to coarse GRAVEL and SILT and CLAY, little fine to coarse Sand (see Sample S-4A).	(A) (A)	
		S-5	24/20	8-10	5-19-7-8	Very stiff, orange-brown layered with green-gray and mottled dark brown at lower 6" of sample, Clay and Silt, little fine to coarse Gravel, trace fine to coarse Sand; containing 6" layer of wood from approximately 9-9.5' depth (see Sample S-5A).	(A) (A)	
10		S-6	24/19	10-12	3-5-7-8	Stiff, dark gray-brown with 6" layer orange-brown at mid sample SILT and CLAY trace fine to coarse Sand; contains few wood fragments.	(A)	12.0'
		S-7	24/19	12-14	3-4-4-4	Stiff, gray-brown grading to orange-brown mottled dark brown with depth CLAY and SILT, trace fine to coarse Sand.	3 (A)	STIFF TO VERY STIFF NATURAL SANDY SILT AND CLAY
15		S-8	24/14	14-15.5	2-3-6-6	Stiff, orange-brown mottled dark brown CLAY and SILT, trace fine to coarse Sand grading to at 15.5;	(A)	
		S-8A	/6	15.5-16		orange-brown mottled dark brown and white Silt and Clay, little fine to coarse Sand.		

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT.	DENSITY
0-4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS:
1. Chosen with regard to "clean and dry" OW-103 and OW-104.
2. Bail approximately 3 gallons from well following reading bringing level to approximately 11.5'.
3. 2" PVC observation well installed with tip at 13' (see attached sheet).
(A) Sample submitted for lab analysis

GZA

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

BORING No. OW-105

GOLDBERG-ZOINO & ASSOCIATES, INC. 320 NEEDHAM ST, NEWTON UPPER FALLS, MA. GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT Geohydrologic Study DEC San German Facility	REPORT OF BORING No OW-105 SHEET 2 OF 2 FILE No. A-3675.2 CHKD. BY

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
		S-9	24/18	16-18	4-8-11-16	Very stiff, orange-brown mottled dark brown and white SILT and CLAY, little fine to coarse Sand.	(A)	STIFF TO VERY STIFF SANDY SILT AND CLAY
								Bottom of Exploration at 18.
20								

REMARKS:

BORING No. OW-105

WELL No. OW-105
BORING No. OW-105
FILE No. A-3675.2

DATE INSTALLED 7/26/83 to 7/27/83

PROJECT DEC Geohydrologic Study

LOCATION San German, P.R.

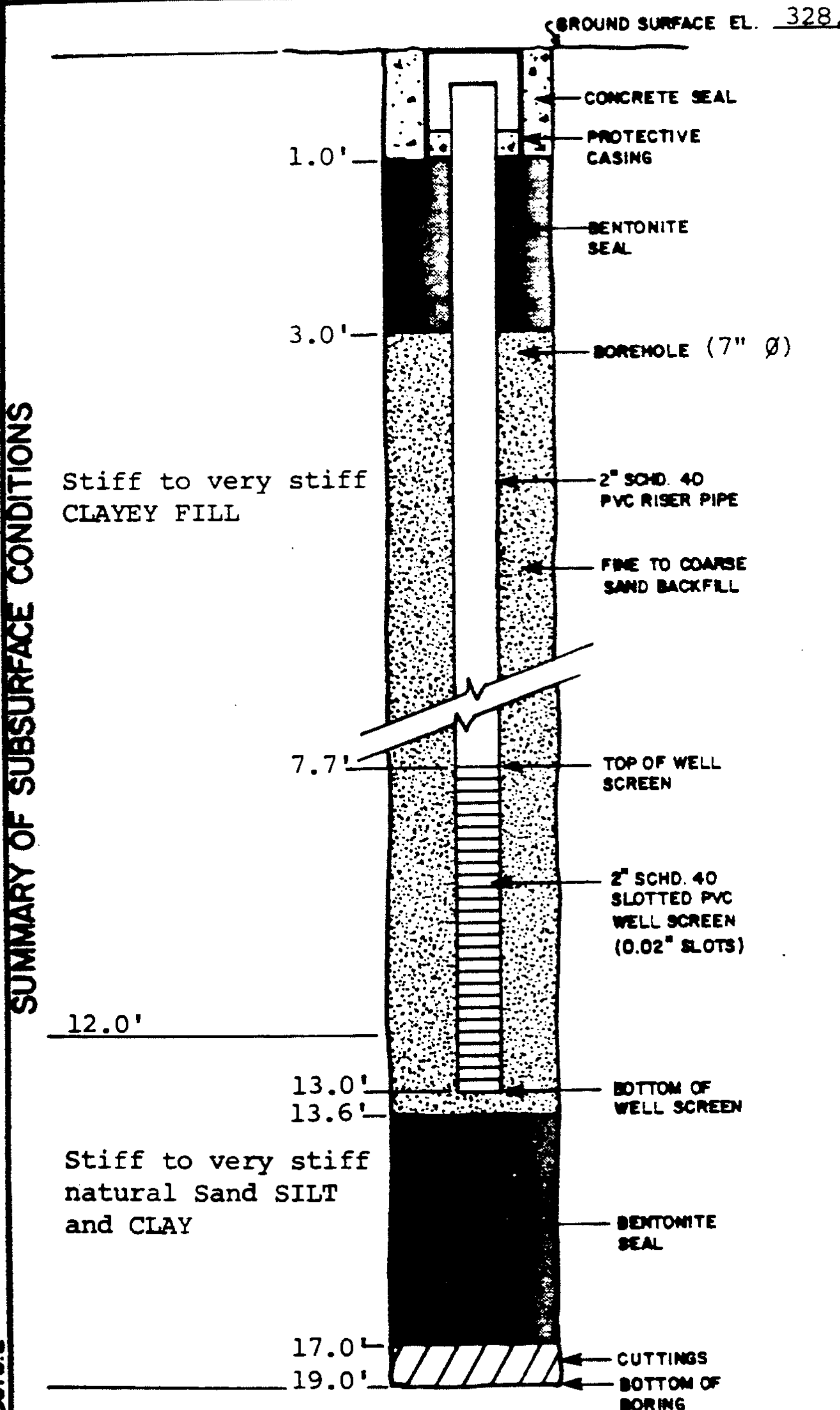
GZA ENGINEER E. Steinberg

CONTRACTOR Geotec

WEATHER CONDITIONS Sunny, 90°F

DRILLER Nicholas Anding

REMARKS See Boring Log OW-105



REMARKS

Installation completed 7/27/83

7/22/83: Surface runoff water from jetting OW-2 filled open borehole of OW-105. 7/26/83: Bail OW-105 to 15.5' (measured upon withdrawing augers) installation of seal attempted, however, Bentonite apparently bridged on water surface up to 13.5'; clean hole by reaming with tamping tool seal installation attempted; Bentonite bridged up to 14.5'. 7/27/83: Attempted to clean hole by augering (to 19'), however, appeared "mudded" below 10' depth upon removing augers. Borehole cleaned to 17' depth by flushing, pump out water to 7.5', seal installed.

NOTE: NOT TO SCALE

FILE No. A-3675.2

GZA

DEPTH/ELEV. BOTTOM OF BORING 19 / 309.7

DEPTH/ELEV. BOTTOM OF WELL POINT 13 / 315.7

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Geohydrologic Study
DEC San German Facility

REPORT OF BORING No. OW-106
SHEET 1 OF 1
FILE No. A-3675.2
CHKD. BY

BORING Co. GEOTEC
FOREMAN Nicholas Andino
GZA ENGINEER E. Steinberg/dlw

BORING LOCATION See plan (1)
GROUND SURFACE ELEVATION 329.1' DATUM Assumed B.M.
DATE START 7/22/83, 7/26/83 DATE END 7/26/83 (borehole), 7/27/83 (well)

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING 300 lb. HAMMER FALLING 24 in.
2-¼" I.D. x 6" O.D.
CASING SIZE: Hollow Stem Auger OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/26	18:15	2.6	WELL	~2 hours (A)
7/31	07:30	3.0	WELL	~4½ days

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
		S-1	24/13	0-1	7-5-3-4	Medium dense, green-gray, fine to coarse GRAVEL and SILT and CLAY, little fine to coarse Sand, changing to	(A)	MEDIUM DENSE GRANULAR FILL 1.0'
		S-1A		1-2		Orange-brown, changing to dark brown SILT and CLAY, trace fine to coarse Sand.	(A)	STIFF TO VERY STIFF CLAYEY FILL
		S-2	24/15	2-4	5-12-10-6	Very stiff, green-gray mixed with orange-brown SILT and CLAY, some fine to coarse Gravel, little fine to coarse Sand.	(A)	
5		S-3	24/24	4-6	3-7-10-7	Very stiff, orange-brown mixed with green-gray SILT and CLAY, little fine to coarse Gravel (with zones varying to and fine to coarse Gravel), trace fine to coarse Sand.	(A)	
		S-4	24/9	6-7	5-6-7-10	Stiff, green-gray SILT and CLAY, some fine to coarse Sand, little fine Gravel changing at 7' to		
		S-4A	/12	7-8		Orange-brown mixed with dark brown CLAY and SILT, little fine Gravel, trace fine to coarse Sand.	(A)	8.0'
		S-5	24/20	8-10	4-6-9-13	Stiff, dark brown mottled orange-brown SILT and CLAY, organic fibers.	2 (A)	
10								
		S-6	24/11	10-11	4-12-12-9	Same as S-5, organic odor; grading at 11' to	(A)	
		S-6A	/12	11-12		Orange-brown mottled dark brown and gray SILT and CLAY, some fine to coarse Gravel (At strata interface), little fine to coarse Sand.		STIFF NATURAL SANDY SILT AND CLAY
		S-7	24/21	12-14	16-25-24-25	Dense, light orange-brown fine+ to medium SAND and SILT, little fine to coarse Gravel, inclusions Silt and Clay comprising 10-20% of sample.	(A)	14.0' Bottom of Exploration at 14.0'
15								

GRANULAR SOILS BLOWS/FT.	DENSITY	COHESIVE SOILS BLOWS/FT.	DENSITY
0-4	V. LOOSE	< 2	V. SOFT
-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS:
1. Selected with regard to "clean" OW-103, 104, and 105.
2. Well installed with tip at 10' (see attached sheet).
(A) Sample submitted for lab analysis.

GZA NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

BORING No. OW-106

WELL No. OW-106
BORING No. OW-106
FILE No. A-3675.2

DATE INSTALLED 7/26/83 to 7/27/83

PROJECT DEC Geohydrologic Study

LOCATION San German, P.R.

GZA ENGINEER E. Steinberg

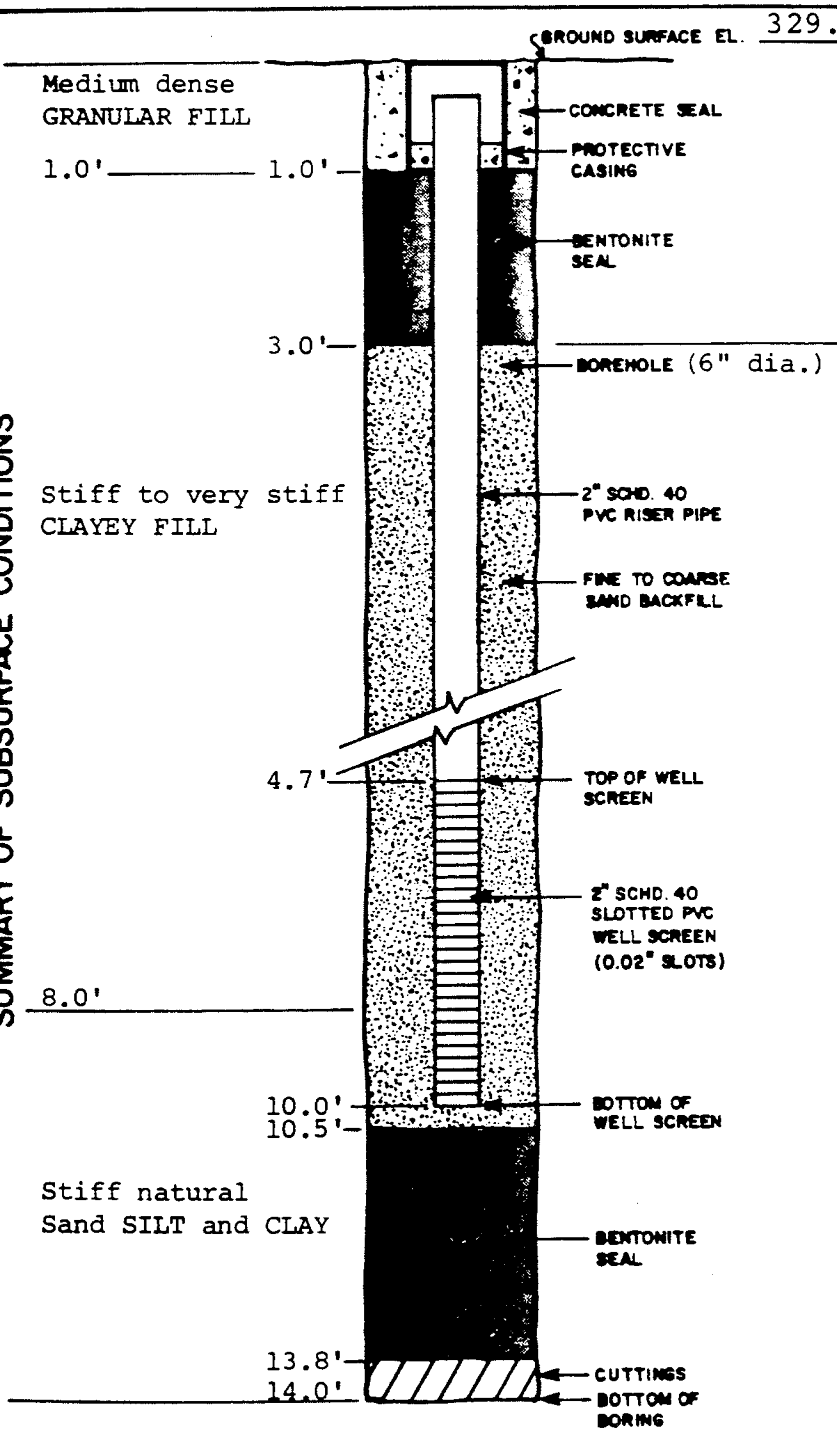
CONTRACTOR Geotec

WEATHER CONDITIONS Sunny, 90°F

DRILLER Nicholas Andino

REMARKS See Boring Log OW-106

SUMMARY OF SUBSURFACE CONDITIONS



REMARKS

Upper Bentonite seal, protective casing and concrete installed 7/27/83

Limit of backfill 7/26/83

Borehole essentially dry during seal installation (slow ground-water seepage). Seal created by adding 1 part water: 2 parts Bentonite

NOTE: NOT TO SCALE

FILE No. A-3675.2

GZA

DEPTH / ELEV. BOTTOM OF BORING 14 / 315.1

DEPTH / ELEV. BOTTOM OF WELL POINT 10 / 319.1

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT: Geohydrologic Study / DEC San German Facility

REPORT OF BORING No. OW-107
SHEET 1 OF 1
FILE No. A-3675.2
CHKD. BY

BORING Co. GEOTEC
FOREMAN Nicholas Andino
GZA ENGINEER E. Steinberg/dlw

BORING LOCATION See Plan (1)
GROUND SURFACE ELEVATION 334.1' DATUM Assumed B.M.
DATE START 7/27/83 DATE END 7/27/83

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING 300 lb. HAMMER FALLING 24 in. 2-1/4" I.D.x 6" O.D.
CASING SIZE: HOLLOW STEM AUGER OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/27	17:00	NONE	WELL	0 hours
7/31	07:30	NONE	WELL	3½ days

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
		S-1	24/14	0-2	2-8-13-8	Medium dense, brown, Clayey SILT, and fine to coarse Gravel, fine to coarse Sand.	(A)	
		S-2	24/12	2-4	6-8-22-15	Similar to S-1 except mixed with green-gray SILT and CLAY.	(A)	STIFF CLAYEY FILL
5		S-3	24/8	4-5	4-10-14-15	Stiff, dark brown mixed with orange-brown and green-gray CLAY and SILT, trace fine to coarse Sand, trace fine Gravel; changing to	(A)	
		S-3A	/11	5-6		Green-gray SILT and CLAY and fine to coarse Gravel, little fine to coarse Sand.	(A)	
		S-4	24/19	6-7.5	5-4-8-12	Stiff, orange-brown CLAY and SILT, trace fine to coarse Sand, trace fine Gravel grading to at lower 6" of sample.	(A)	
		S-4A	/3	7.5-8		Green-gray, fine to coarse GRAVEL and SILT and CLAY, little fine to coarse Sand.	(A)	
		S-5	24/23	8-10	3-4-5-7	Stiff, orange-brown mixed with dark brown CLAY and SILT, little fine Gravel, trace fine to coarse Sand.	(A)	
10								
		S-6	24/8	10-11	4-10-16-18	Stiff, dark gray-brown Clayey SILT, trace fine Gravel, trace fine to coarse Sand.	(A)	11.0'
		S-6A	/8	11-12		Changing at 11.0' to green-gray mixed with orange-brown SILT and CLAY, some fine Gravel, little fine to coarse Sand.	(A) 2	VERY DENSE NATURAL GRAVELLY SILT AND CLAY
		S-7	24/20	12-14	12-16-20-23	Similar to S-6A except very stiff.	(A) 2 3	
15		S-8	24/21	14-16	12-25-30-38	Very dense, fine to coarse GRAVEL, some Silt and Clay, some fine to coarse Sand (gravel angular)	(A) 2	
		S-9	24/17	16-18	21-31-31-28	Very dense SILT and CLAY and fine Gravel, little fine to coarse Sand.	(A) 2	

Bottom of Exploration at 18.0'

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT.	DENSITY
0-4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS:
1. Location selected with regard to "clean" OW-2, OW-106.
2. Sample Dry.
3. 2" PVC observation well installed with tip at 12.5' (see attached sheet).
(A) Sample submitted for lab analysis.

GZA NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

BORING No. OW-107

WELL No. OW-107
BORING No. OW-107
FILE No. A-3675.2

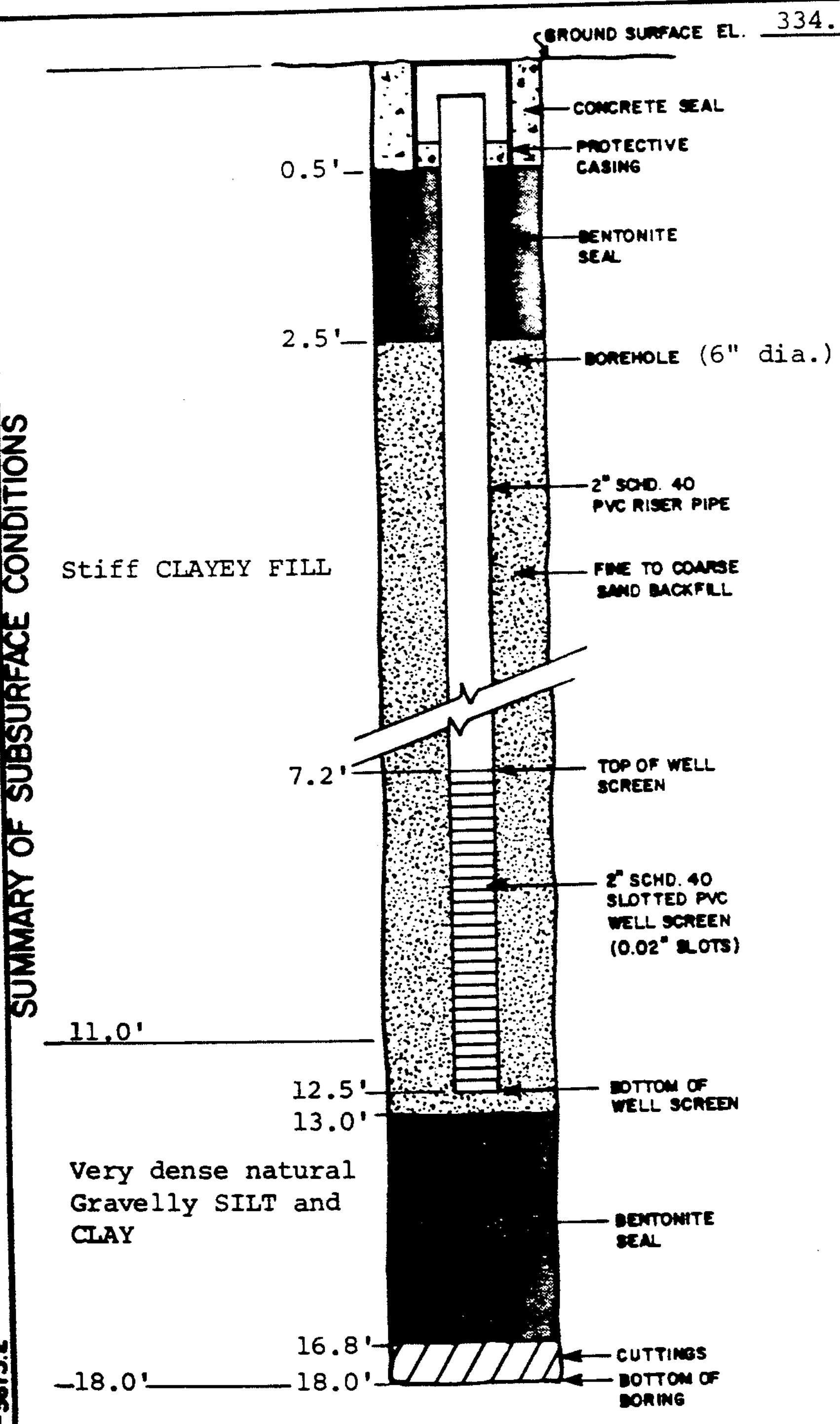
DATE INSTALLED 7/27/83

PROJECT DEC Geohydrologic Study
LOCATION San German, P.R.

GZA ENGINEER E. Steinberg
CONTRACTOR Geotec

WEATHER CONDITIONS Sunny, 90°F
DRILLER Nicholas Anding

REMARKS See Boring Log OW-107



REMARKS

Installation completed 7/27/83

Borehole dry during well installation, seal created by adding sufficient water to each layer Bentonite (visible on surface of layer)

Difficulty experienced extractin augers

FILE No. A-3675.2

NOTE: NOT TO SCALE

DEPTH / ELEV. BOTTOM OF BORING 18 / 316.1

DEPTH / ELEV. BOTTOM OF WELL POINT 12.5 / 321.6

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.

GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT

Geohydrologic Study
DEC San German Facility

REPORT OF BORING No. OW-108
SHEET 1 OF 2
FILE No. A-3675.2
CHKD. BY

BORING Co. GEOTEC
FOREMAN Nicholas Andino
GZA ENGINEER E. Steinberg

BORING LOCATION See Plan (1)
GROUND SURFACE ELEVATION 333.3' DATUM Assumed B.M.
DATE START 7/28/83 DATE END 7/28/83

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING 300 lb. HAMMER FALLING 24 in.
2-¼" I.D. x 6" O.D.

CASING SIZE: Hollow Stem Auger OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/28	13:00	9.9	WELL	1 hour (A)
7/29	09:00	7.8	WELL	21 hours
7/31	07:30	7.7	WELL	43 hours

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
		S-1	24/14	0-2	7-8-13-15	Very stiff, brown SILT and CLAY, little fine to coarse Gravel, little fine to coarse Sand.	(A)	
		S-2	24/15	2-4	9-7-9-11	Similar to S-1 except brown mixed with gray-brown.	(A)	
5		S-3	24/12	4-6	10-8-9-13	Very stiff, green-gray mixed with orange-brown SILT and CLAY, some fine to coarse Gravel, little fine to coarse Sand.	(A)	STIFF TO VERY STIFF CLAYEY FILL
		S-4	24/10	6-8	5-5-6-9	Stiff, orange-brown mixed with red-brown and green-gray CLAY and SILT, little fine to coarse Gravel, trace fine to coarse Sand.	(A)	
		S-5	24/12	8-10	7-7-6-10	Same as S-4.	(A)	
10								
		S-6	24/16	10-12	7-10-10-13	Very stiff, orange-brown mixed with green-gray and dark brown SILT and CLAY, trace fine to coarse Sand, trace fine Gravel.	(A)	
		S-7	24/14	12-13.5	4-6-8-11	Stiff, orange-brown with zones of dark brown CLAY and SILT, trace fine to coarse Sand, trace fine Gravel.	(A)	13.5'
		S-7A	/6	13.5-14		changes at 13.5' to dark gray-brown SILT and CLAY, little fine Gravel, trace fine to coarse Sand, Roots, organic odor.	(A)	STIFF NATURAL CLAY AND SILT
15								
		S-8	24/19	14-16	5-6-6-8	Stiff, gray-brown grading to orange-brown mottled dark brown and green-gray CLAY and SILT, trace fine to coarse Sand.	(A)	17.0'
								(see next sheet)

GRANULAR SOILS BLOWS/FT.	DENSITY	COHESIVE SOILS BLOWS/FT.	DENSITY
0-4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS:
1. Location selected with regard to OW-2, OW-106 and OW-107.
2. 2" PVC observation well installed with tip at 13.5' - see attached sheet.
(A) Sample submitted for lab analysis.

GZA NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

BORING No. OW-108

GOLDBERG-ZOINO & ASSOCIATES, INC.
320 NEEDHAM ST, NEWTON UPPER FALLS, MA.
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Geohydrologic Study
DEC San German Facility

REPORT OF BORING No. GW-108
SHEET 2 OF 2
FILE No. A-3675.[illegible]
CHKD. BY

DEPTH (ft)	CASING (bl/ft)	SAMPLE No.	PEN. (in)/REC.	DEPTH (ft)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	REMARKS	STRATUM DESCRIPTION
		S-9	24/12	16-17	6-12-23-26	Stiff, orange-brown mottled green-gray CLAY and SILT, trace fine to coarse Sand grading at 17' to	(A)	STIFF CLAY AND SILT
		S-9A	/8	17-18		Yellow-brown SILT, some fine Sand.	(A)	VERY STIFF SANDY SILT 17.0'
								Bottom of Exploration at 18.0'
20								

REMARKS:

GZA

BORING No.

WELL No. OW-108
BORING No. OW-108
FILE No. A-3675.2

DATE INSTALLED 7/28/83

PROJECT DEC Geohydrologic Study

LOCATION San German, P.R.

GZA ENGINEER E. Steinberg

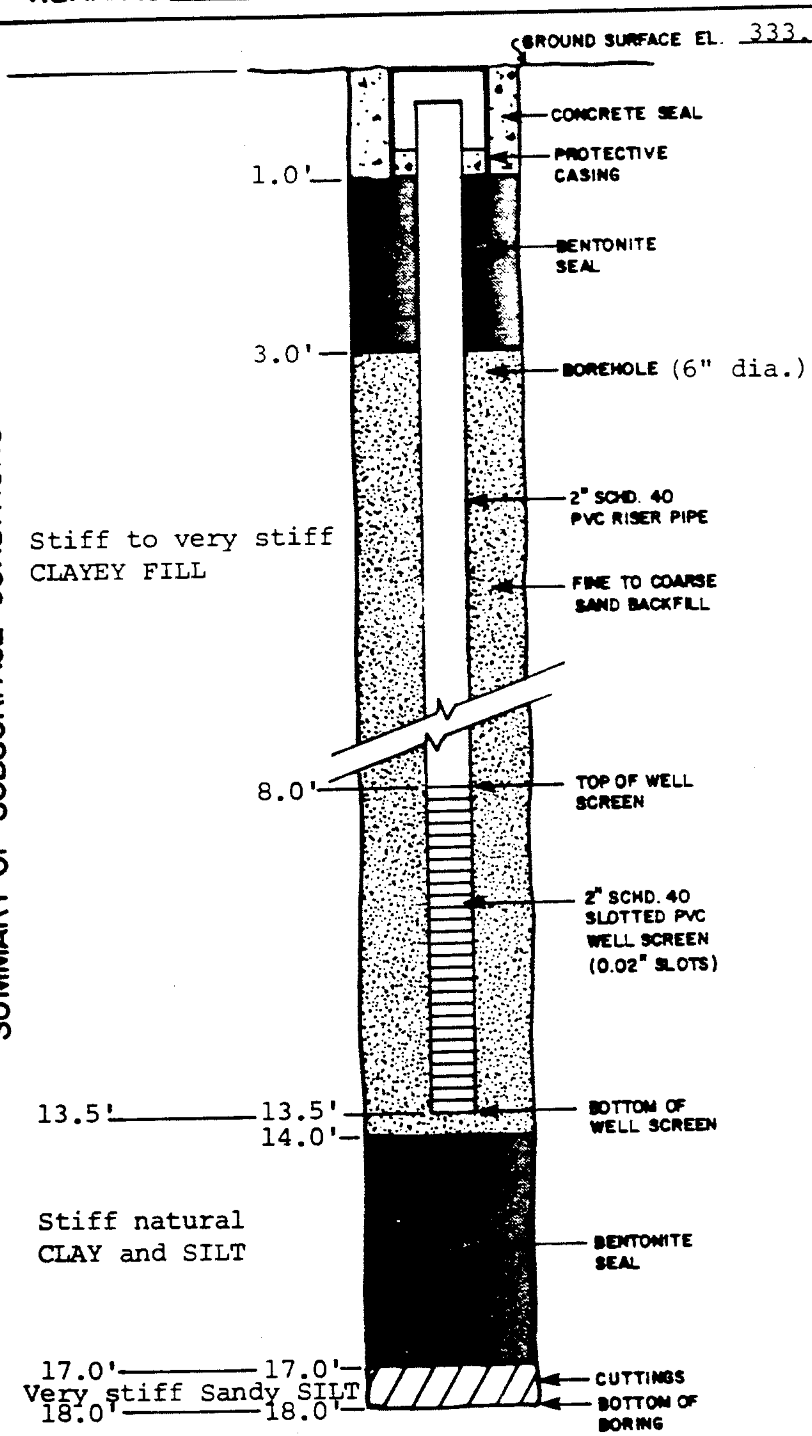
CONTRACTOR Geotec

WEATHER CONDITIONS Sunny, 90°F

DRILLER Nicholas Andino

REMARKS See Boring Log OW-108

SUMMARY OF SUBSURFACE CONDITIONS



REMARKS

Installation completed 7/28/83

Borehole dry during well installation, to create seal add sufficient water to each layer Bentonite (visible on surface of each layer)

NOTE: NOT TO SCALE

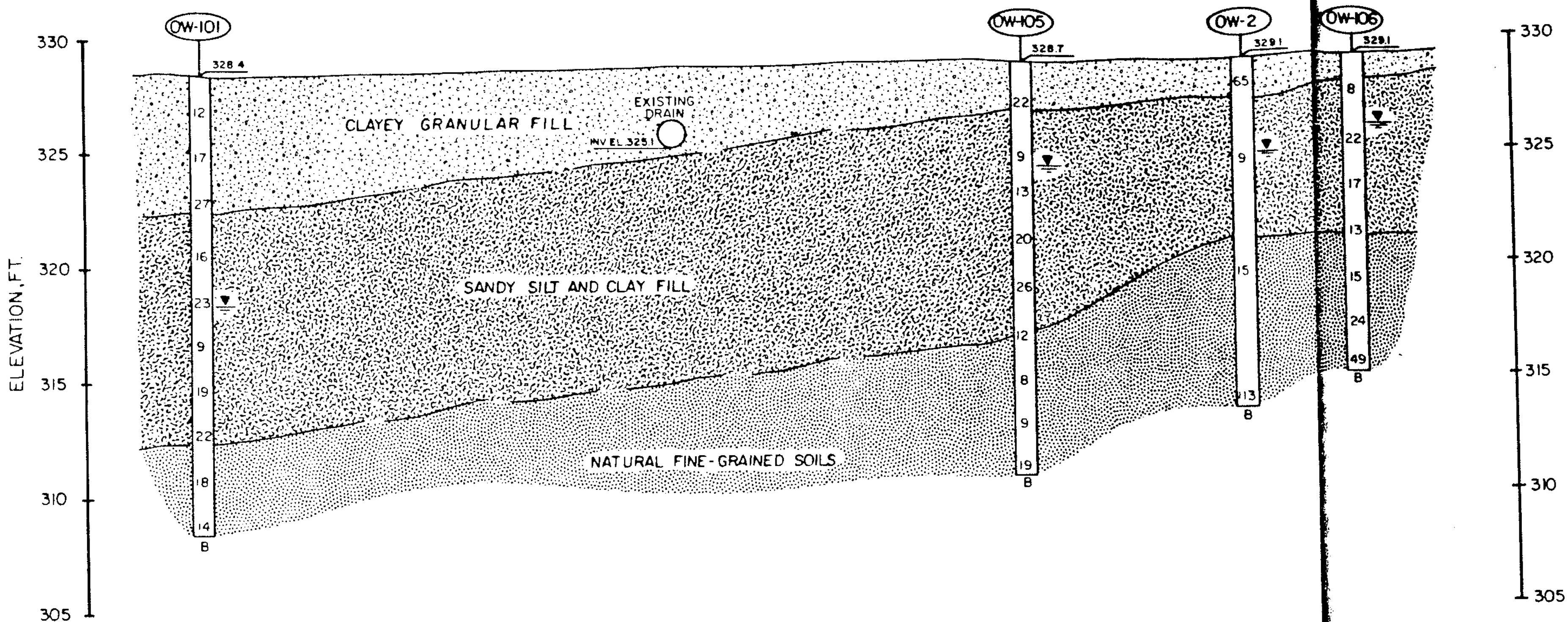
FILE No. A-3675.2

DEPTH / ELEV. BOTTOM OF BORING 18 / 315.3

DEPTH / ELEV. BOTTOM OF WELL POINT 13.5 / 319.8

GZA

EXHIBIT NO. 26



NOTES:

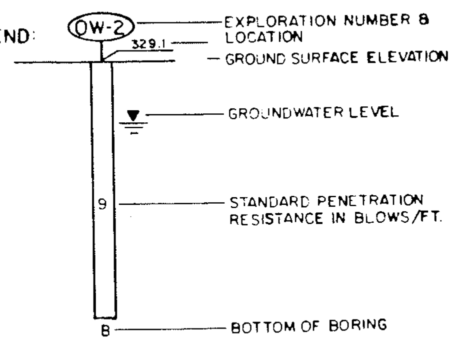
1) THE STRATIFICATION LINES ARE BASED UPON INTERPOLATIONS BETWEEN WIDELY SPACED EXPLORATIONS AND THUS REPRESENTS THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. ACTUAL TRANSITIONS MAY DIFFER FROM THOSE SHOWN.

2) WATER LEVEL READINGS HAVE BEEN MADE IN DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE LOGS. THIS DATA HAS BEEN REVIEWED AND INTERPRETATIONS MADE IN THE TEXT OF THE REPORT. HOWEVER, IT MUST BE STATED THAT FLUCTUATION IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO VARIATIONS IN RIVER LEVEL, TEMPERATURE, RAINFALL AND OTHER FACTORS.

3) ELEVATIONS REFERENCED TO ASSUMED BENCH MARK SHOWN ON PLAN BY LUIS MORA & ASSOC., DATED 9/8/83, ENTITLED "POINTS LOCATION PLAN, DIGITAL SAN GERMAN, P.R."

4) LOCATION OF PROFILE A-A' ILLUSTRATED ON FIGURE No. 2

LEGEND:

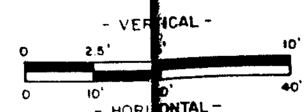


SOIL DESCRIPTIONS:

MEDIUM DENSE TO DENSE FINE TO COARSE SAND & GRAVEL CONTAINING 20%-50% SILT AND CLAY, FILL

STIFF TO VERY STIFF SILT AND CLAY CONTAINING UP TO 20% FINE TO COARSE SAND AND FINE TO COARSE GRAVEL, FILL

STIFF TO VERY STIFF SILT AND CLAY CONTAINING UP TO 35% FINE TO COARSE SAND AND FINE TO COARSE GRAVEL, NATURAL RESIDUAL SOILS.



GZA

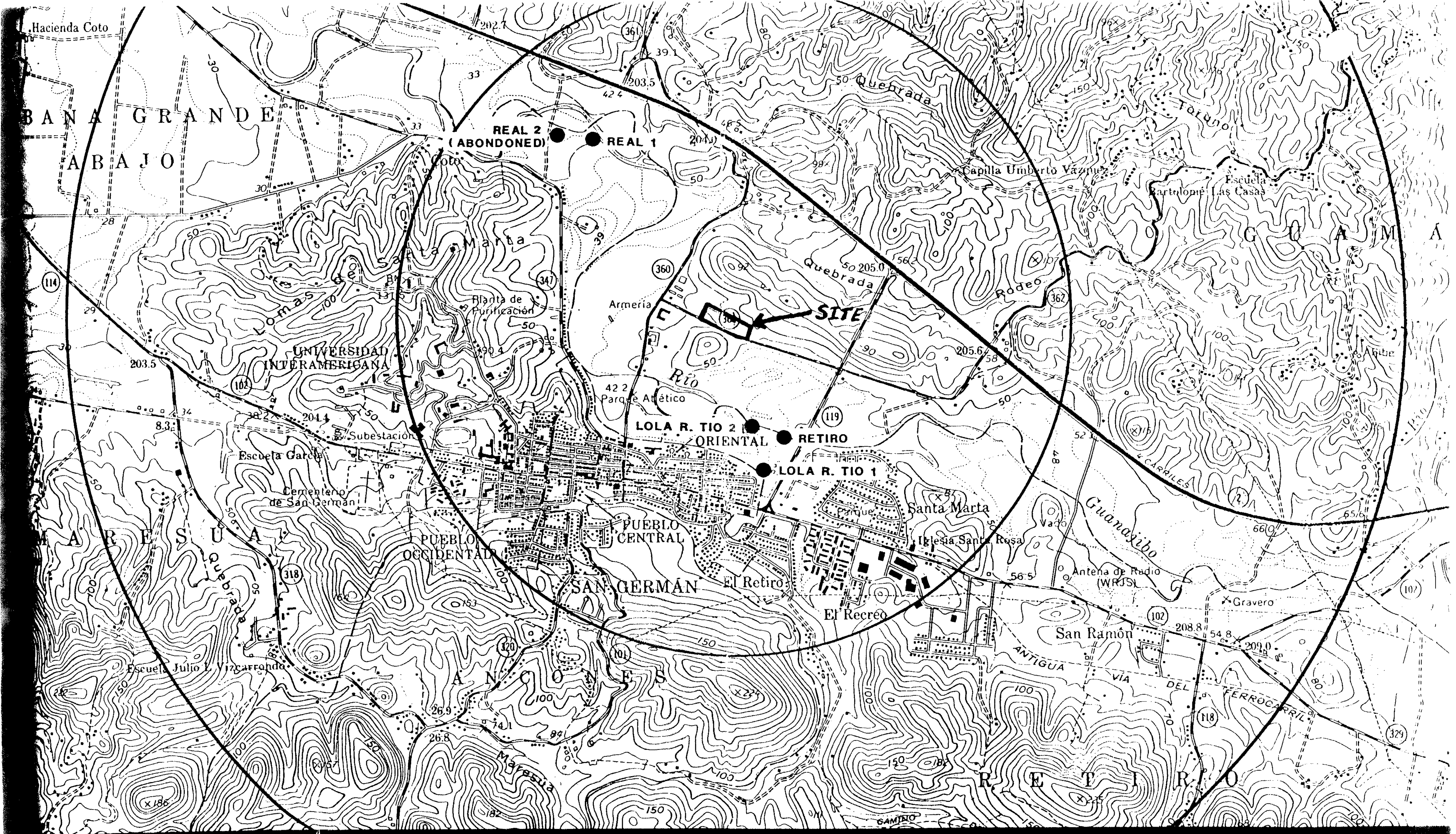
GEOHYDROLOGIC STUDY
DIGITAL EQUIPMENT CORP.
SAN GERMAN FACILITY, P.R.

SUBSURFACE PROFILE A-A'

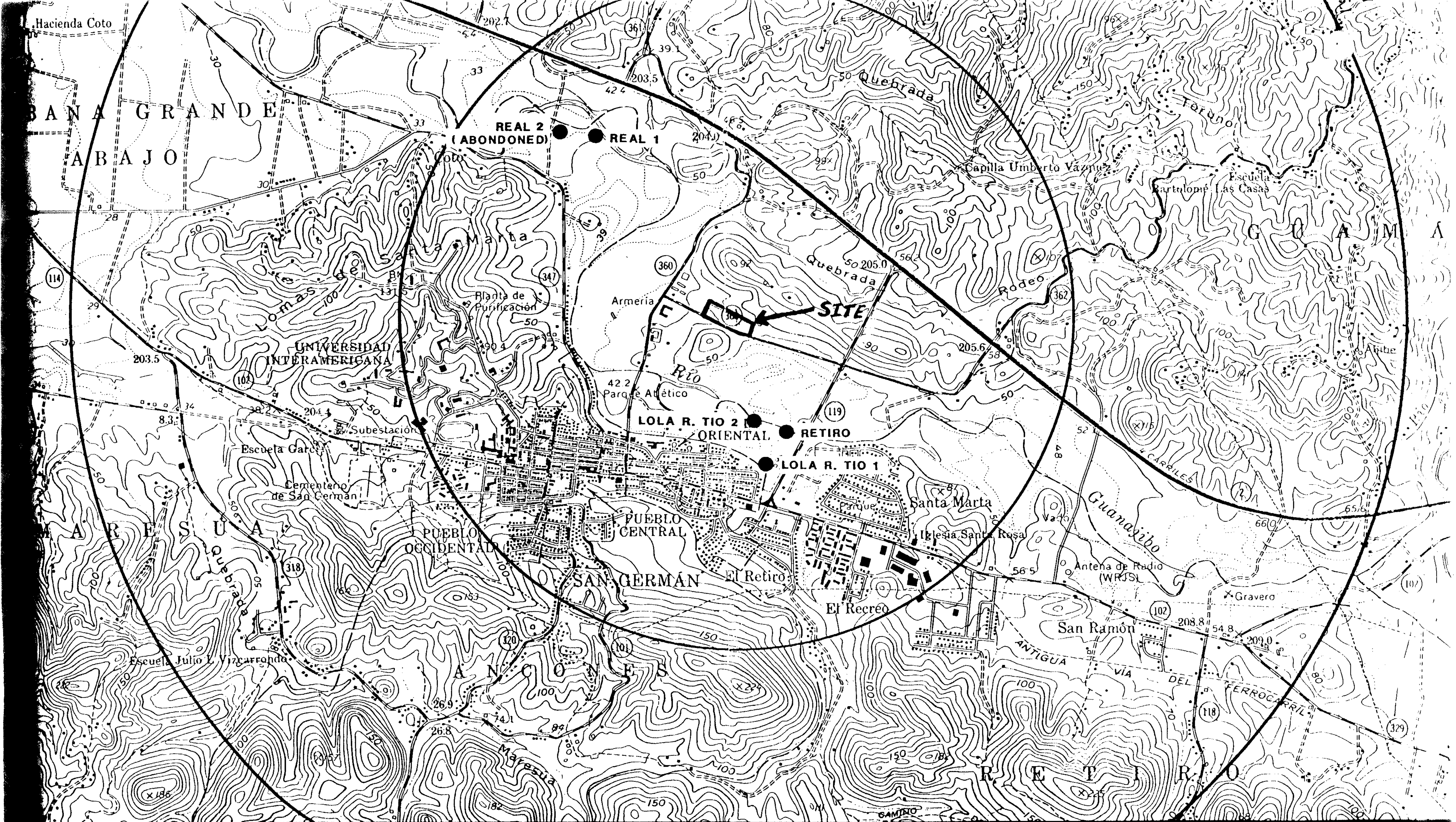
NOV 1983

FIGURE No. 7

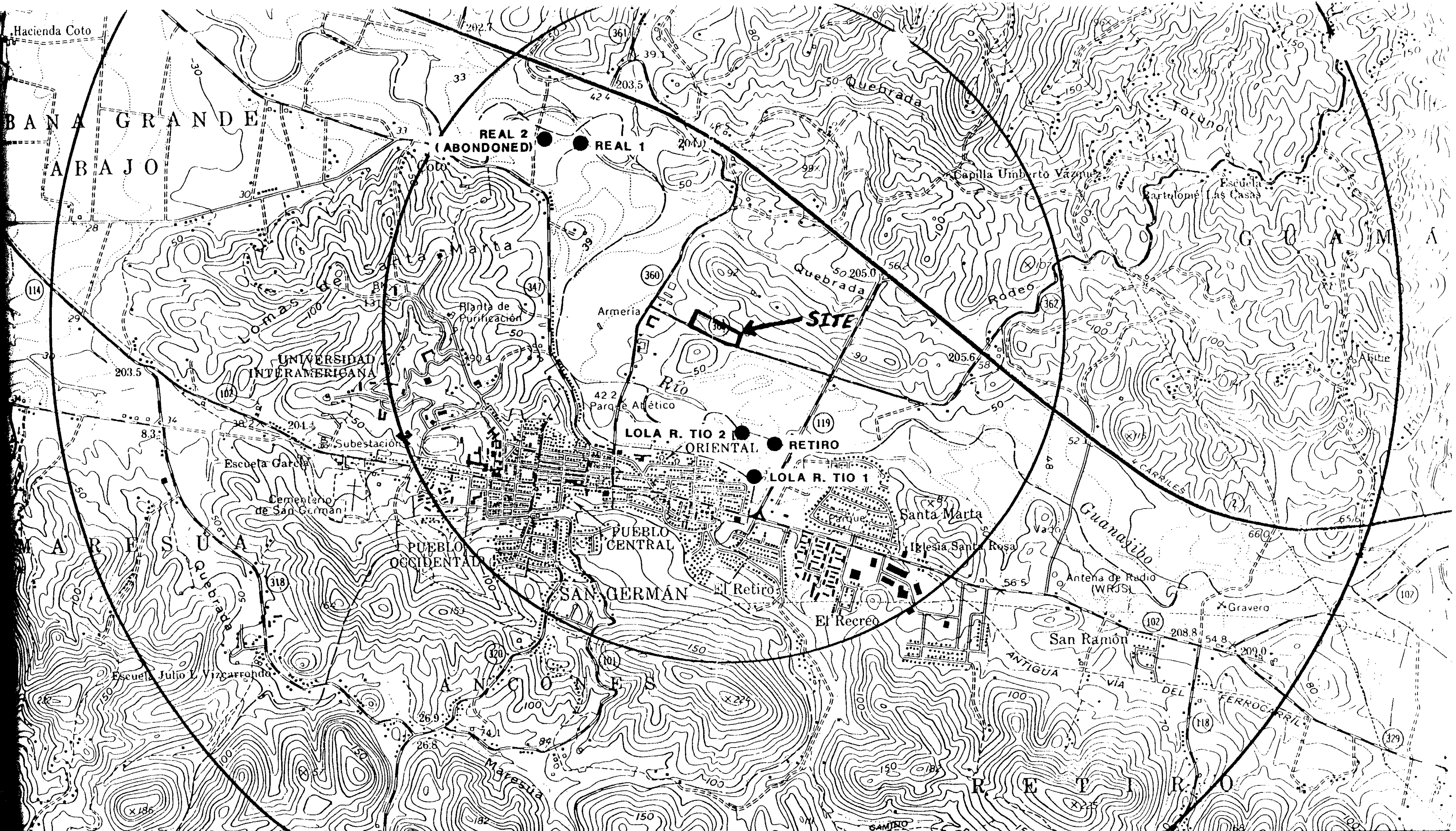
EXHIBIT NO. 27



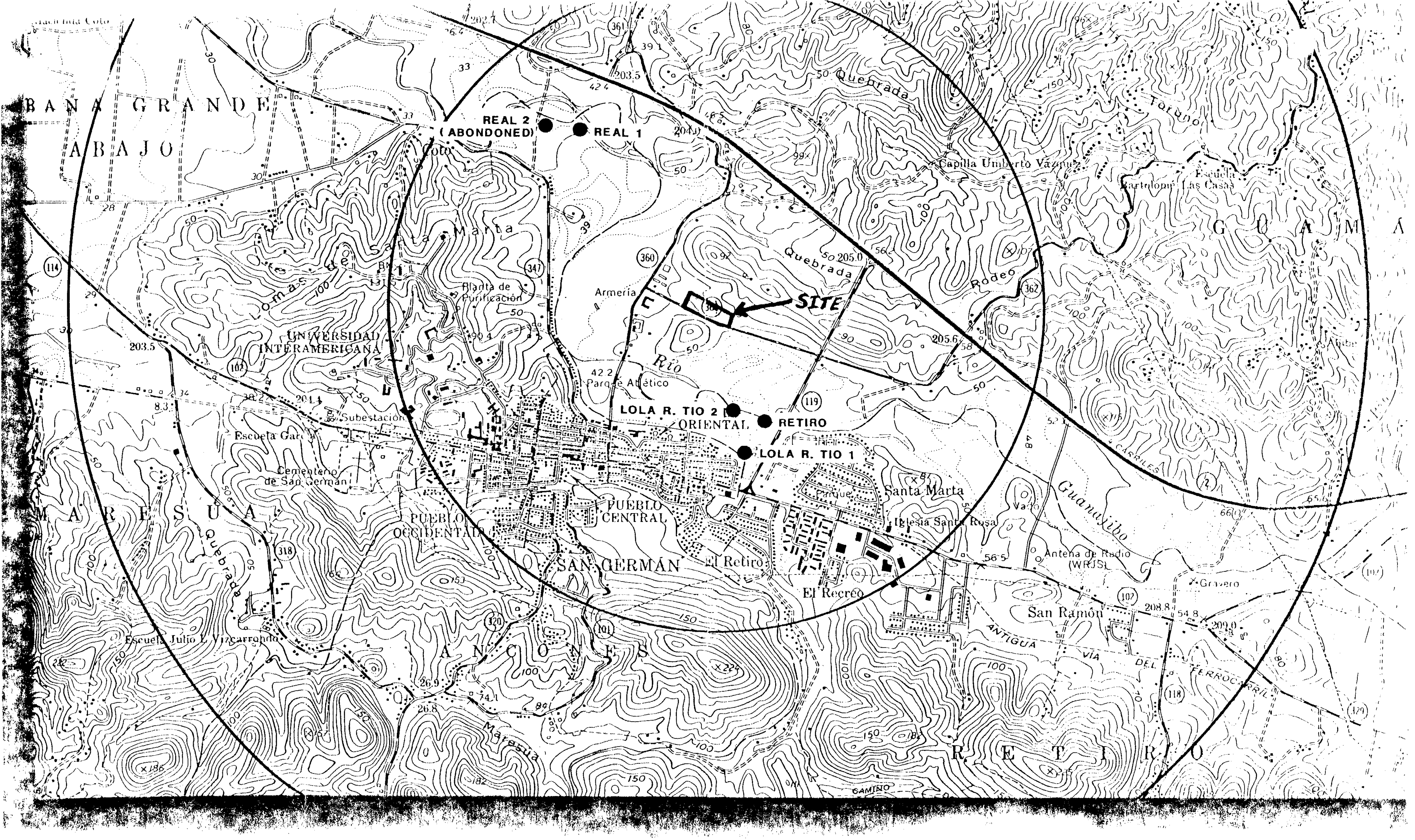
SITE
REAL 2 (ABONDONED)
REAL 1
LOLA R. TIO 2
RETIRO
LOLA R. TIO 1
Hacienda Coto
SABANA GRANDE ABAJO
Lomas de Santa Marta
UNIVERSIDAD INTERAMERICANA
Planta de Purificación
Armeria
Parque Atlético
Río Guanajibo
Quebrada Rodeo
Quebrada Toruno
Capilla Umberto Vazquez
Escuela Bartolomé Las Casas
GUAMA
Subestación
Escuela García
Cementerio de San Germán
PUEBLO OCCIDENTAL
PUEBLO CENTRAL
ORIENTAL
SAN GERMÁN
El Retiro
El Recreo
Santa Marta
Iglesia Santa Rosa
Antena de Radio (WRJS)
Gravero
San Ramón
ANTIGUA VÍA DEL FERROCARRIL
MARESUA
Quebrada Maresua
Escuela Julio L. Vizcarrondo
ANCONES
RETIRO
4 CARRILES
Vado



SITE
REAL 2 (ABONDONED)
REAL 1
LOLA R. TIO 2
LOLA R. TIO 1
RETIRO
SAN GERMÁN
PUEBLO CENTRAL
PUEBLO OCCIDENTAL
ORIENTAL
UNIVERSIDAD INTERAMERICANA
Planta de Purificación
Armeria
Parque Atlético
Río Guanajibo
Quebrada Rodeo
Santa Marta
Iglesia Santa Rosa
Antena de Radio (WRJS)
San Ramón
El Retiro
El Recreo
Cementerio de San Germán
Escuela García
Subestación
Hacienda Coto
SABANA GRANDE ABAJO
GUAMA
MARESUA
ANCONES
RETIRO
Lomas de Santa Marta
Capilla Umberto Vazquez
Escuela Bartolomé Las Casas
Escuela Julio L. Vizcarrondo
ANTIGUA VÍA DEL FERROCARRIL
CARRILES
Gravero



SITE
REAL 2
(ABONDONED)
REAL 1
LOLA R. TIO 2
RETIRO
LOLA R. TIO 1
Hacienda Coto
BANA GRANDE
ABAJO
GUAMA
MARESUA
ANCONES
RETIRO
SAN GERMÁN
PUEBLO CENTRAL
PUEBLO OCCIDENTAL
ORIENTAL
UNIVERSIDAD INTERAMERICANA
Lomas de Santa Marta
Planta de Purificación
Armeria
Parque Atlético
Río
Quebrada Rodeo
Quebrada Toruno
Capilla Umberto Vázquez
Escuela Bartolomé Las Casas
Subestación
Escuela García
Cementerio de San Germán
Santa Marta
Parque
Iglesia Santa Rosa
Guanajibo
Antena de Radio (WRJS)
Gravero
San Ramón
El Retiro
El Recreo
ANTIGUA VÍA DEL FERROCARRIL
4 CARRILES
Escuela Julio L. Vizcarrondo
Quebrada
Maresua
Coto


REAL 2
(ABONDONED)
REAL 1
SITE
LOLA R. TIO 2
RETIRO
LOLA R. TIO 1
BANA GRANDE
ABAJO
GUAMA
MARESUA
ANCONES
RETIRO
SAN GERMÁN
PUEBLO OCCIDENTAL
PUEBLO CENTRAL
ORIENTAL
UNIVERSIDAD INTERAMERICANA
Planta de Purificación
Armería
Parque Atlético
Subestación
Escuela García
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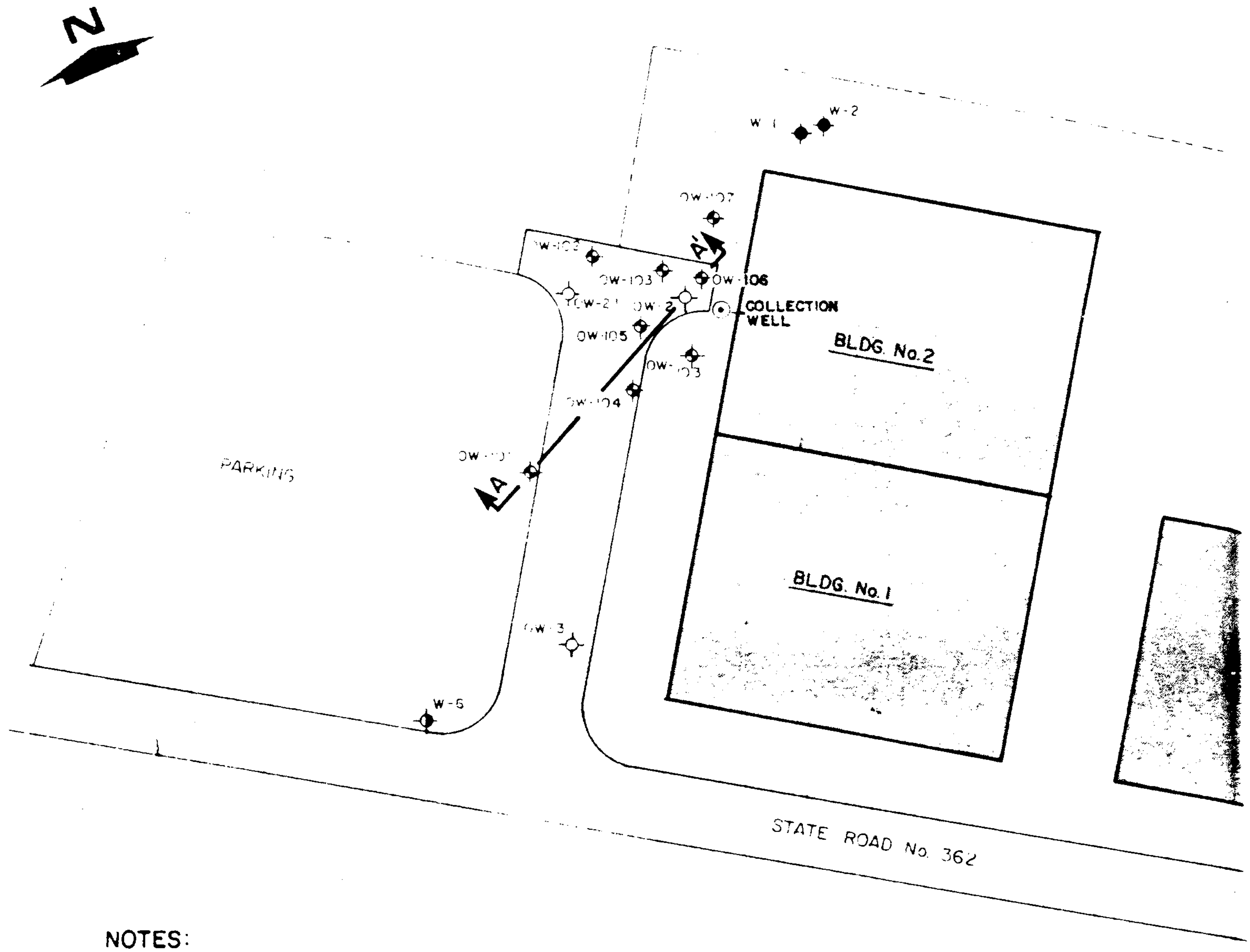
El Retiro
El Recreo
San Ramón
Gravero
Capilla Umberto Vázquez
Quebrada Toruno
Quebrada Rodeo
Río Guanajibo
ANTIGUA VÍA DEL FERROCARRIL
CARRILES

EXHIBIT NO. 28

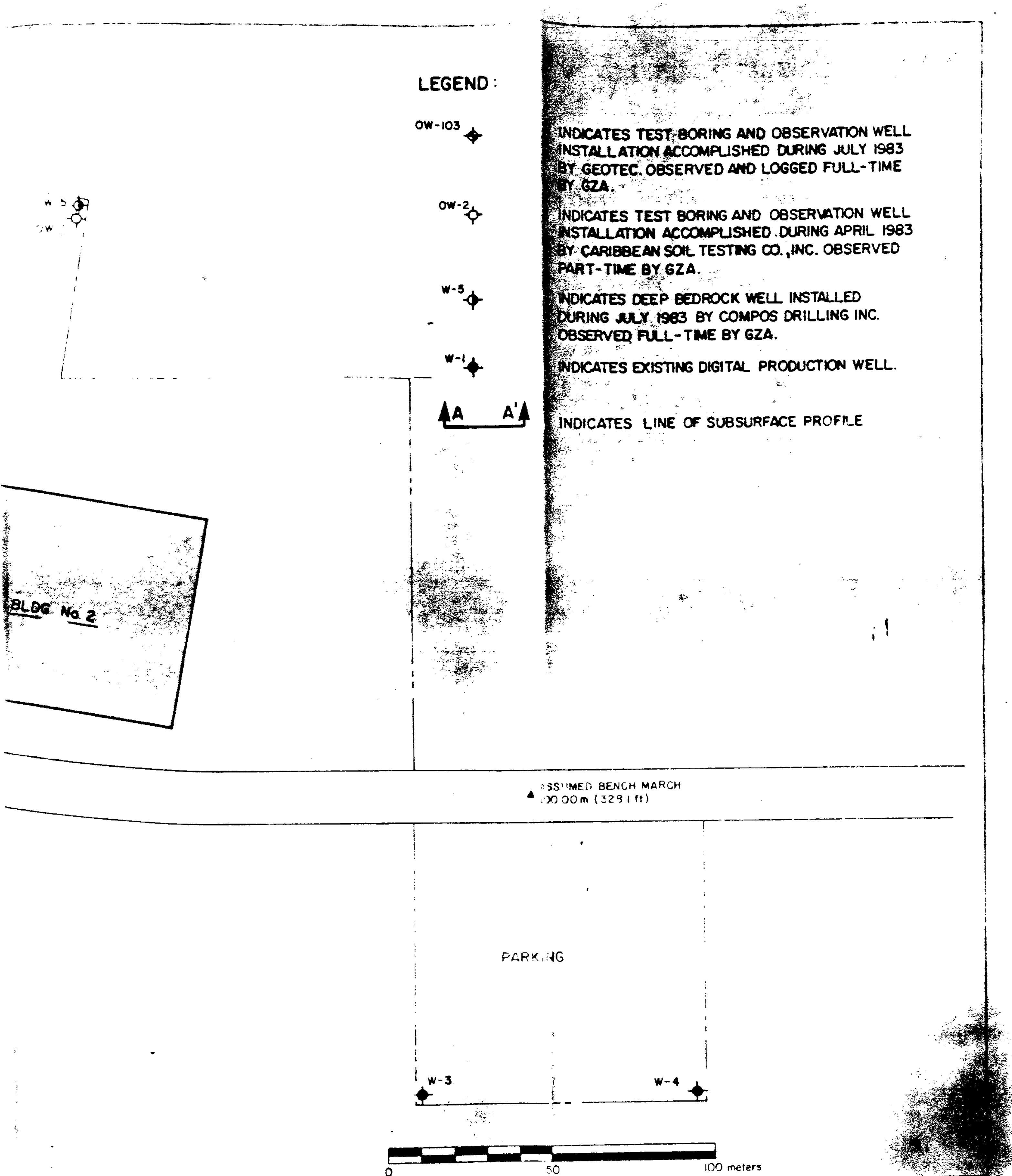


NOTES:

1) BASE MAP DEVELOPED FROM PLAN PROVIDED BY LUIS MORA & ASSOC., DATED 9/8/83, ENTITLED, "POINTS LOCATION PLAN, DIGITAL SAN GERMAN, P.R.

2) LOCATION OF OW-3 SCALED FROM DRAWING PROVIDED BY CARIBBEAN SOIL TESTING CO., ENTITLED EXPLORATION PLAN, UNDATED. LOCATIONS, IN PLAN AND ELEVATION, OF REMAINING EXPLORATIONS AND WELLS ESTABLISHED BY LUIS MORA & ASSOC., USING OPTICAL SURVEY MEASUREMENTS. LOCATIONS AND ELEVATIONS INDICATED SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHODS USED.

FILE No. A-3675 2



GEOHYDROLOGIC STUDY
DIGITAL EQUIPMENT CORP.
SAN GERMAN FACILITY, P.R.

EXPLORATION LOCATION PLAN

NOV. 1983

FIGURE No. 2

EXHIBIT NO. 29

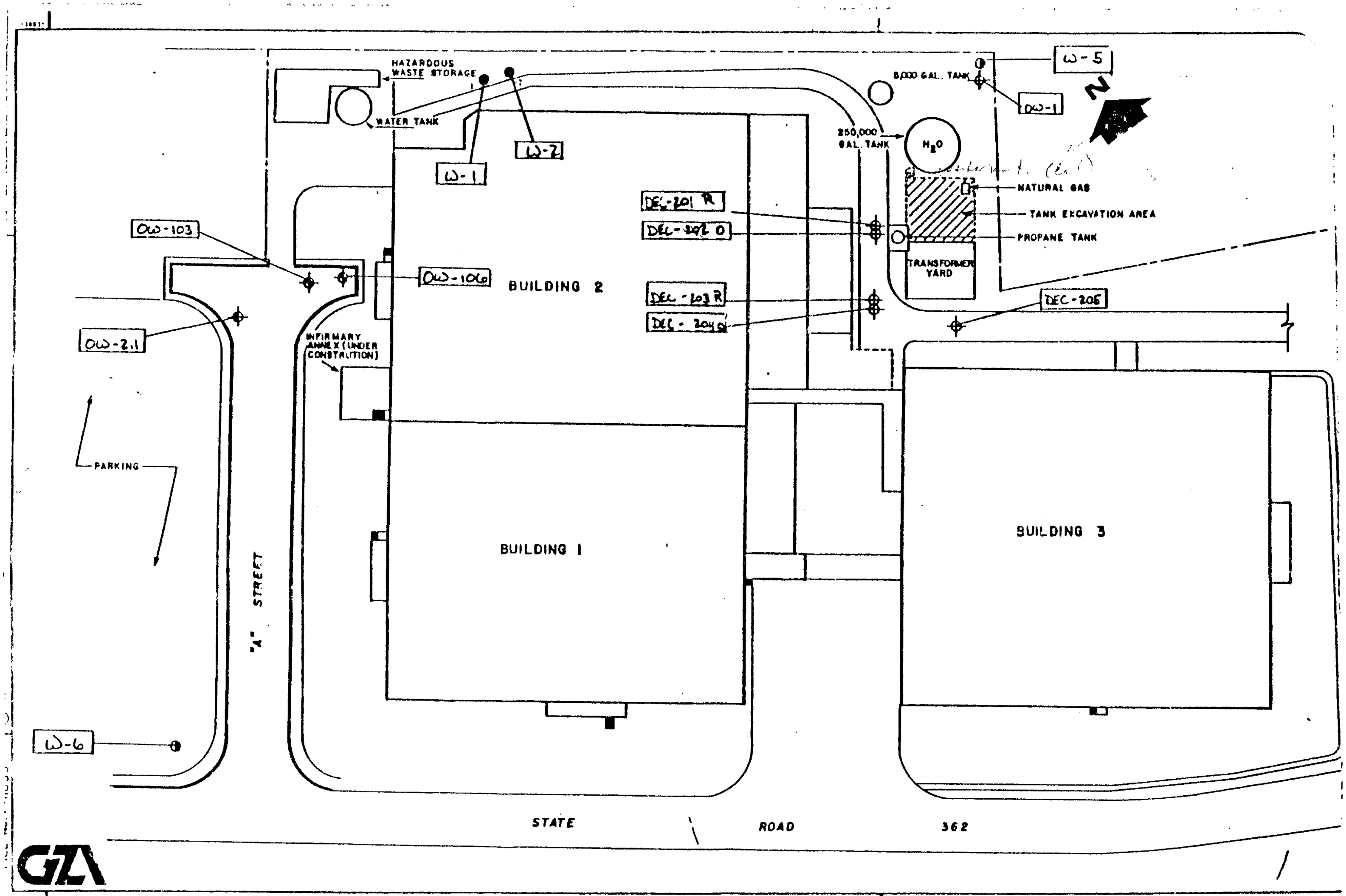

HAZARDOUS WASTE STORAGE
WATER TANK
W-1
W-2
W-5
8,000 GAL. TANK
OW-1
N
250,000 GAL. TANK
H_2O
NATURAL GAS
TANK EXCAVATION AREA
PROPANE TANK
TRANSFORMER YARD
DEC-201 R
DEC-202 O
DEC-203 R
DEC-204 O
DEC-205
OW-103
OW-106
OW-2.1
BUILDING 2
INFIRMARY ANNEX (UNDER CONSTRUCTION)
PARKING
"A" STREET
BUILDING 1
BUILDING 3
W-6
STATE ROAD 362
GZA

EXHIBIT NO. 30

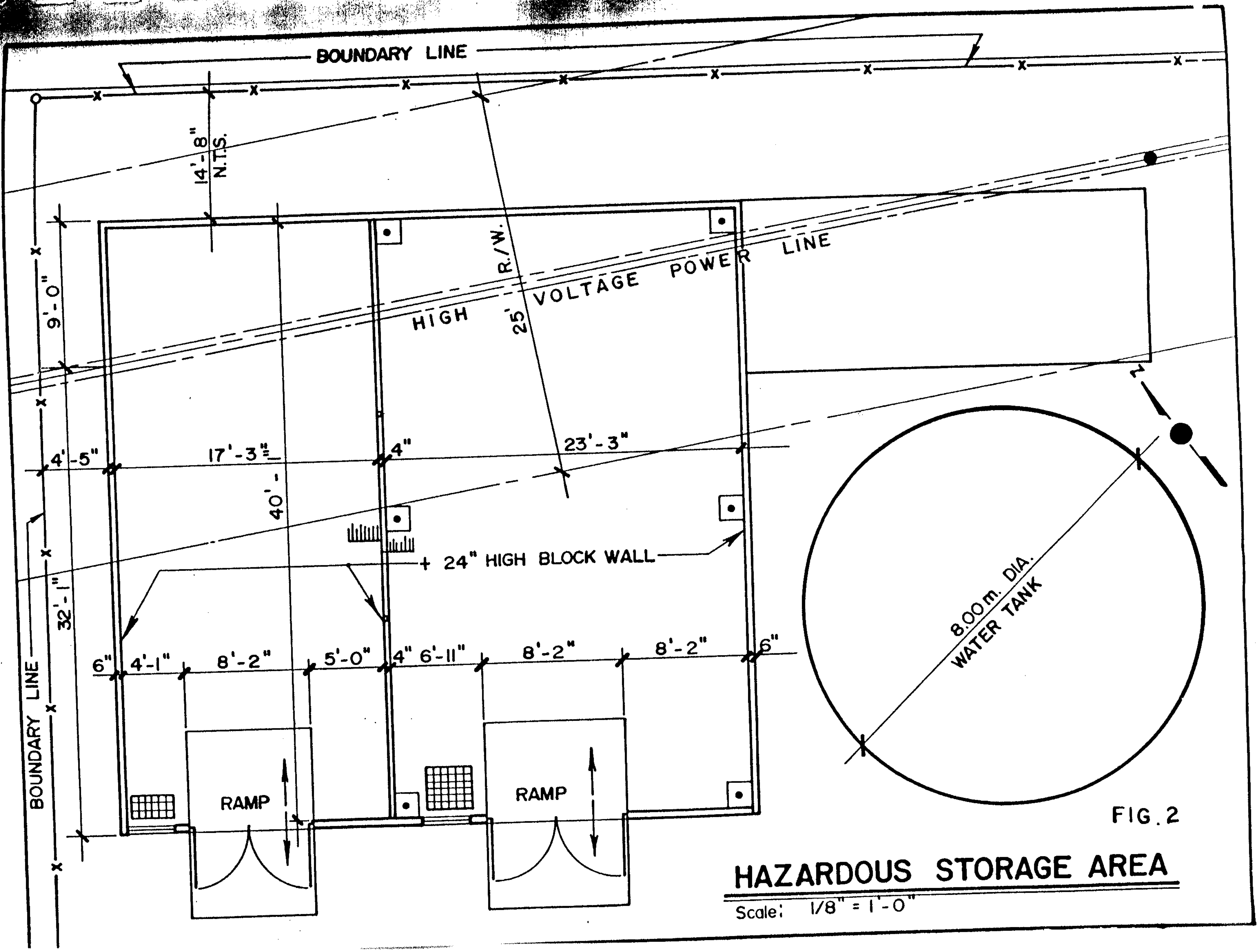


FIG. 2

HAZARDOUS STORAGE AREA

Scale: 1/8" = 1'-0"

EXHIBIT NO. 31

WASTEWATER TREATMENT UNIT

GENERAL OPERATION OF THE WASTE TREATMENT FACILITY

Process Waste Treatment Plant

The process waste treatment plant generates the metallic sludge which is listed as a hazardous waste F006. The process waste treatment plant receives wastewaters which contain metallic ions. These are removed from the wastewaters by precipitation of pH adjustment, and then settled in a sedimentation tank, where the sludge settles to the bottom of the tank.

Chemical Treatment of Metallic Ions

The design of the existing effluent treatment system considered the effectiveness of the chemical treatment technique dependent on the nature of the pollutant, the nature and concentration of interfering ions, the procedure of adding the appropriate amount of chemicals, adjusting of pH, reaction time, temperature considerations, and the effective separation of the precipitated solids in their hydroxide form. The concentration of have metals achievable by the chemical techniques currently employed for treating metallic wastes are expected to comply with both Federal and Commonwealth (PRASA) limitations. The goal is to achieve at least the effluent limitations indicated in the EPA Publication Development Document for Proposed Existing Source Pretreatment Standard for the Metal Finishing Standard, EPA 40 CFR 433. These standards are achieved with the chemical treatment provided. The treated wastewaters from the plant are discharged to the municipal sewerage system at San Germàn operated by PRASA. Laboratory tests for the control of the metallic ions escaping treatment is done daily at the WWTP laboratory. As well, samples are sent to private laboratories for analysis on a weekly basis.

Separation of Precipitated Hydroxides

The separation of the suspended solids, or metallic hydroxides already precipitated is a very important step in the treatment process. These suspended solids are insoluble metallic precipitates.

In the process waste treatment system, the mixing occurs at a tank, and then goes to a sedimentation tank with a baffle, where the precipitated hydroxides are settled. The overflow goes over the baffles, and the carryover of suspended solids, which are the metallic hydroxides, have ample time to settle in this other part of the basin. Retention time of the whole sedimentation tank is about two hours. The effluent will go to the municipal sewerage system, while the solids pass to a filter press for dewatering, resulting in a cake. The filter press cake is shipped to continental U.S. for metal recovery or final disposal in an approved hazardous waste site.

The discharge will be done in accordance with the amendments to the Puerto Rico Aqueduct and Sewer Authority's Rules and Regulations for the Supply of Water and Sewer Service.

OVERVIEW OF WASTEWATER TREATMENT SYSTEM

INTRODUCTION

The purpose of this instruction manual is to familiarize the operator with the WMI Waste Treatment System.

No wastewater treatment system can function properly without a capable and trained operator. WMI suggests that one be appointed as soon as possible so that he may be involved during installation and start-up.

The position requires an operator capable of learning and understanding the tried and proven principles utilized in the WMI system. It also requires monitoring of the system, simple testing of composite solutions, maintaining records as required by regulatory agencies, ordering of the treatment supplies, performing normal and preventive maintenance and trouble shooting the treatment system.

As with all equipment, optimum results can only be achieved as the operator gains experience with the system. During the learning stages, the operator will become familiar with the following areas. This will help him to understand and operate the treatment system at its optimum level.

1. Knowledge of waste generating streams.
   a. Sources
   b. Contaminants

2. Flow Schematic

3. Equipment Supplied

4. Instrumentation
   a. Uses
   b. Calibration

5. Treatment chemistry supplied

6. Chemical reactions

7. Control of wastewater to treatment system
   a. Points of introduction
   b. Flow designs
   c. Concentrated dumps
      1) Dumping Schedules
      2) Bleeding Rates

8. Upsets and Mistreatment
   a. Causes
   b. Corrections

9. Record Keeping
   a. Importance
   b. Requirements

10. Preventive Maintenance

11. Check Lists

12. Good Housekeeping

13. Safety

Emphasis is on the operator. This is because he plays a very important role in controlling the waste treatment system. As learning and experience progresses, the areas discussed become second nature to the operator, and attention to the system is reduced to periodic checks freeing the operator for other duties.

TREATMENT SYSTEM START-UP

Start-Up:

1. Insure that all panel switches are in "OFF" position.

2. Turn on power to main control panel by placing manual disconnect switch in the "ON" position.

3. Turn on all sub panels and remote disconnects.

4. Place all panel selector switches in "Automatic" or "ON" position.

The treatment system is now operational.

Shut Down:

To turn off treatment system, reverse procedure used in start-up.

ALARM SYSTEM AND TREATMENT FAIL SAFE

Treatment Alarms:

The purpose of the alarm system is to prevent untreated water from leaving the treatment system. It is connected to all of the sensing loops incorporated in the treatment system.

If the pH or ORP is incorrect, a chemical feed pump makes proper additions.

Pressing the alarm silence button acknowledges the condition only. The alarm bell or buzzer stops and the visual light stays on.

Even in alarm condition the reagent additions continue to correct the condition. If a correction occurs the system will automatically go out of alarm.

Level Alarms:

This alarm warns of impending sump overflow.

PROBE CLEANING AND INSTRUMENT CALIBRATION

Probe cleaning is a very important function of preventive maintenance. Improperly cleaned probes can cause mistreatment. Probes should be cleaned and calibrated to the instrument at least once a week, more, if conditions warrant.

Equipment or Material Required:

1	-	3 to 5 gallon pail for water
1	-	3 to 5 gallon pail for acid cleaning
1	-	3 to 5 gallon pail for buffer solution (borax - 9.2)
1	-	500 ml. beaker for buffer solution
1	-	portable pH meter
1 qt.	-	10.0 buffer solution
1 qt.	-	4.0 buffer solution
1 box	-	borax cleaning powder

The following two (2) methods are recommended:

Method 1 - Borax Cleaning Powder Method

Borax cleaning powder when added to water will saturate solution, that results in a pH of 9.2.

1. Calibrate portable pH meter with 10.0 buffer solution.

2. Add 3 - 4 cups of borax cleaning to 3 gallons of water in pail.

3. Check pH of solution. Reading should be 9.2.

4. Make up pail with plain tap water.

5. Make up pail with acid cleaning solution
   a) 1 qt. muriatic acid diluted to 5 gallons water.

6. Remove probe from tank holder

7. Rinse probe in water

8. Wash probe in acid solution

9. Rinse probe in water solution

10. Place probe in borax buffer solution

11 Check pH of solution with portable meter
   a. Verify pH of solution

12. Calibrate instrument in run position to 9.2.

13. Replace probe in tank.

Borax may be used over again as long as pH is verified with calibrated portable pH meter.

Method II - Using known value buffer solutions:

These buffer solutions lose value very quickly and must be discarded when calibration is complete. They are very expensive.

The same precleaning methods are used as described in Method I. With the exception of using clean 500 ml. beaker instead of pail.

NOTE: If acid cleaning of probes fails to clean unit, a soft bristle brush or soft cloth may be required to clean glass electrode. Never use a knife or any abrasive material to clean probe. Ceramic white spot must be clean and visible. Light scrapping with the fingernail or pocket knife blade may be used if handled carefully.

CHEMICAL FEED PUMPS

All chemical feed pumps operate on demand from the control center. Pumping rate is varied per instructions printed on the pump.

The acid, alkali, and chrome reducer pumps receive their signal from the pH and ORP instruments. The rest operate in conjunction with the waste treatment sump pump.

Determining the Pump Settings:

Generally a wide degree of feed control is available by varying either or both of the two parameters, reagent concentration, and pumping rate.

Stronger reagents at slower pumping rates reduce reagent refill frequency.

If the reagent is too strong or pumped too fast, the correction will be too large and cause the sensing meters to overshoot and start an opposite correction. This is wasteful.

Treatment Tank Mixers:

The treatment tank mixers should be on at all times that the system is operating.

PUMP OPERATION AND ADJUSTMENTS

A. Pump Failure Causes

Attempt to restart pump by reactivating pumping circuit and observing pumping unit. This is accomplished by turning off panel control switch and back on again.

1) Pump motor does not run

   a. Check magnetic starter heaters for overload
      1. Reset and check amperage draw against motor identification specifications.
   b. Check line fuses to magnetic starter
   c. Check power supply to pump on output side of starter
   d. Check power supply to motor at motor connections
   e. Test rotor in pump to insure free movement
   f. If pump rotor is frozen or has restricted movement, remove pump head to determine reason.
   g. Test pump motor for electrical failure.

2) Motor starter does not engage

   a. Test for power to magentic starter coil, replace coil if necessary.

   b. Test pump electrical circuit for component failure.
      1. Relays, time delays, terminal connections, etc.

CHEMICAL FEED MODULE

All reagents required for control of the waste treatment system are prepared and fed from a WMI Chemical Feed Module.

The WMI Chemical Feed Module is designed to incorporate all of the reagents required for a specific designed waste treatment system.

Each reagent tank is equipped as follows:

1. Mixers
2. Manual fresh water filling valves
3. Chemical Feed pump
4. Reagent preparation tank

OPERATIONS SUGGESTIONS

1. Inspect all equipment and instrumentation daily.

2. Clean, inspect, and calibrate probes against a known pH using separate pH meter at least once a week.

3. Make daily checks of feed module for feed pump operation, solution levels, and concentrations. Run feed module mixers daily to insure that stratification of solution has not occured on standing. (Run for thirty seconds to one minute.)

4. Clean filters daily.

5. Check flow control valves to system.

6. Spot check chrome destruct tank with test kit to insure complete chrome reduction.

7. Spot check cyanide destruct tank periodically with potassium iodide starch paper to insure excess bleach is present.

8. Maintain log on additions, flow, pH, ORP and results. This can be useful information on evaluation of treatment. This information can be used as a guideline for optimizing treatment.

9. Clean up chemical spills as soon as possible to eliminate corrosive action to equipment and insure safety of operator.

PREVENTIVE MAINTENANCE

Preventive maintenance programs should be set up to minimize costly shut downs and repairs due to equipment failure.

Equipment manuals are supplied to assist you in setting up a maintenance program. Our experience has shown that these manuals are usually filed away for future reference in event a failure occurs. In many cases we have found that they have been lost or misplaced.

Preventive maintenance programs start with equipment manual. These manuals contain information on installation, operating instructions, preventive maintenance, spare parts lists, troubleshooting and repair. The manuals should be filed in an area that they are readily accessible by all concerned with maintenance.

Each equipment manual should be studied thoroughly to understand the operation of the unit. Special attention should be given to the trouble shooting and repair. This section lists problems, causes and correction. These areas should be incorporated into the preventive maintenance program as part of the inspection or maintenance procedure.

Periodic inspection of the treatment system and associated equipment should be the first step of a preventive maintenance program. This duty is usually assigned to the treatment system operator because he has daily contact with the equipment. He is aware whether the equipment is functioning properly or if it is experiencing problems in specific areas.

Operator daily inspection should include:

1. Inspect all plumbing for leaks or excessive vibration. Solution leaks have been a major contributing factor to electrical component failure.

2. Inspect all pumping stations.
   a) Pump Operation
   b) Seal Leakage
   c) Excessive Noises (bearings, etc.)
   d) Suction Leaks
   f) Valve Settings

Closed or improperly set valves can contribute to pump failure.

3. Inspect all mixer operations
   a) Mixer Operation
   b) Excessive vibration or noises (bearings, etc.)
   c) Position mounting bolts or locks (loose mixer can damage associated equipment).

4. Air or hydraulic leaks: Inspect all equipment requiring use of air or hydraulic oil.

5. Lubrication points: Inspect all areas where lubrication oilers are installed and air/water separators are required. Drain as required.

6. Exercise all valves as required to insure proper positions and avoid frozen valves.

7. Clean and calibrate treatment probes as required.

8. Inspect all alarm timer setpoints.

9. Maintain inspection and maintenance records or logs. These records can become a valuable tool in the maintenance program by indicating what areas should require more attention.

The preventive maintenance program is usually assigned to the maintenance department. Scheduled maintenance program should be determined from information derived from:

1. Treatment operator inspection reports
2. Equipment manuals recommendations
3. Other preventive maintenance programs in effect

The spare parts list provided was derived form customer purchases of repair parts. It is indicative of areas that required replacement or repair. It is recommended that this list is reviewed and a spare parts inventory be maintained on site, especially of items that cannot be purchased locally or are long lead time delivery items.

pH Analysis:

Sample should be collected in a clean container and analyzed as soon as possible after collection date. Record the time that the sample was taken. Sample bottle should not be opened before analysis.

KEEPING RECORDS

The importance of keeping records cannot be overstressed; and is done for the following reasons:

1. It is required under your Environmental Protection Agency discharge permit.
2. It will make the operator more efficient in that he will be able to predict the chemicals required.
3. If treatment difficulties are encountered the information is essential for rapid trouble shooting.
4. It reduces the chances for mistakes.

3

OPERATION

OPERATION

Section 1
PROCESS DESCRIPTION

The decant filtrate and complexed rinse streams enter the complexed rinse collection tank 105 T1 through a basket strainer. The level in the tank is sensed by level switches LS1 - LS4. These level switches control the operation of the complexed process pumps, 102 PW1 and 102 PW2. In the event that these pumps fail to keep up with the incoming stream, an audible/visual alarm will be enabled.

The complexed process pumps transfer the collected waste rinses from tank 105 T1 to reaction tank 105 T2. The function of this tank is to break the chelating characteristics of the rinse stream. This is accomplished by mixing and adjusting the pH with sulfuric acid and feeding phosphoric acid and sodium hydrosulfite. The pH is controlled by the Leeds & Northrup pH meter and its corresponding LMI pump for sulfuric acid. The LMI pumps for sodium hydrosulfite and phosphoric acid are interfaced with the transfer pump system for tank 105 T1.

The waste stream then flows by gravity to reaction tank 105 T3. The function of this tank is first stage pH neutralization. This is accomplished by mixing and feeding lime to elevate the pH. The pH is controlled by a Leeds & Northrup pH meter and probe.

The stream then flows by gravity to reaction tank 105 T4. The function of this tank is second stage pH neutralization. This tank is equippped and operated similar to 105 T3.

The stream then flows by gravity to 105 T5. The function of this tank is flash mix/flocculation. The metal precipitate that has been formed by the previous operations is allowed to grow in size and weight by adding polymer in the flash mix area to enhance the settling rate. The polymerized stream is then gently mixed in the flocculation section to promote large floc particle growth.

After flocculation in 105 T5, the waste stream enters the clarifier 105 T6. The function of this tank is to accomplish liquid/solid separation. The solids settle into the bottom cone and the liquid rises through the plate packs and into the effluent launder. The solids are automatically removed by a sludge pump that is activated by a timer in the control panel. A sludge recirculation pump is also provided to assist floc formation by adding small amounts of settled solids to the flocculation section.

The waste stream then flows by gravity to tank 105 T7, which is the water collection tank. The function of this tank is to act as source reservoir for the polishing filter pumps. The polishing filter pumps and alarm system are activated by level switches LS5 - LS7, which are located in tank 105 T7.

The polishing filter pumps transfer the treated water through the Penfield filters 105 F1A and 105 F1B to the final pH adjustment tank 102 T7. Refer to the Penfield O & M Manual for further information concerning filter operations.

The final pH adjustment tank 102 T7 serves two functions. One
function is to adjust the pH of the treated water to meet local discharge
regulations. The second function is to provide a reservoir of clean water
for backwashing the Penfield filters. This tank is equipped with a
sulfuric acid feed system which is controlled by a Leeds & Northrup pH
meter and probe, for pH adjustment. This tank is also equipped with level
switches LC1 - LC4, which control the operation of the mixer and recycle
pump.

A backwash supply tank 105 T14 (existing T-10) is connected to serve
as a backwash water reservoir for the Penfield filters. This tank is
equipped with level switches LS8 - LS10, which control the backwash pump
for the Penfield filters. The backwash water is pumped from the backwash
supply tank 105 T14 through the Penfield filters and into the backwash
holding tank 105 T13. The backwash water is then pumped back to the
complexed rinse collection tank 105 T1 for retreatment.

An effluent monitoring tank 102 EMS1 is provided to monitor the flow
from the system and provide a sample reservoir for the ISCO sampler. This
tank is equipped with a 90 degree V notch weir and a Drexelbrook flow
sensor.

Check the process control section for further details on the proper
operation of the individual components of the system.

SYSTEM COMPONENTS INDEX

Component Identification	Description
LS1 - LS12	B & O Level Switch
LC1 - LC4	Warrick 1G1CO
102PW1	Fybroc 1530
102PW2	Fybroc 1530
105PW1	Wilden M1 PO/PU
105PW2	Wilden M4 WO/NE
105PW3	Gould 3655 2 x 2 x 7S
105PW4	Gould 3655 2 x 2 x 7S
102PW3	Gould 3655 2 x 2 x 7S
105MP1	LMI D141-36
105MP2	LMI D141-36
105MP3	LMI D131-36
105MP4	LMI D141-36
105MP5	Wilden M-1 PO/PU
105MX1	Lightnin XJ117
105MX2	Lightnin XJ87
105MX3	Lightnin XJ87
105MX4	Lightnin Mark 1
102MX4	Lightnin XJ174
105MX5	Mixer supplied by Digital
105MX6	Lightnin Mark 1
105MX7	Lightnin Mark 1
pH Meter	Leeds & Northrup 7082-11
pH Probe	Leeds & Northrup 777-3-02
Flow Monitor	Drexelbrook 303-341-102
Flow Monitor Display	Drexelbrook 303-3020-1
Sampler	ISCO 2900
Alarm Module	GLI 46-101
Strip Chart Recorder	Yokogawa 4152-110
Flow Totalizer	Veeder-Root 744396-23

SYSTEM COMPONENTS USEAGE CHART

Tank#	Volume	Function	*Level Control	Pumps	Mixers	Misc. Auxillary Equip
105T1	875 gal	Complexed Rinse Collection	LS1-1S4	102PW1 102PW2		
105T2	3150 gal	Complexed Treatment			105MX1	Leeds & Northrup pH
105T3	2200 gal	First Stage pH Neut			105MX2	Leeds & Northrup pH
105T4	2200 gal	Second Stage pH Neut			105MX3	Leeds & Northrup pH
105T5	350 gal	Flash Mix/Flocculation			105MX4	
105T6		Inclined Plate Clarifier		105PW1 105PW2		Automatic Sludge Bl
105T7	1275 gal	Water Collection	LS5-LS7	105PW3 105PW4		
105F1A		Penfield Filter				
105F1B		Penfield Filter				
102T7	3500 gal	Final pH Adjustment	LC1-LC4	102PW3	102MX4	Leeds & Northrup pH
102EMS1	850 gal	Effluent Monitoring				Drexelbrook Flow M Isco Effluent Sampl
105T8	110 gal	Sodium Hydrosulfite Feed		105MP2	105MX7	Service to 105T2
105T9	110 gal	Phosphoric Acid Feed		105MP3		Service to 105T2
105T10	110 gal	Lime Feed		105MP5	105MX5	Service to 105T3,1
105T11	110 gal	Polymer Feed		105MP4	105MX6	Service to 105T5
105T12	110 gal	Sulfuric Acid Feed		105MP1		Service to 105T2,1

#[illegible]	Volume	Function	*Level Control	Pumps	Mixers	Monitoring Devices
T13	2100 gal	Backwash Supply Tank	LS8-LS10	105PW3 105PW4		
T14	2100 gal	Backwash Holding Tank	LS11-LS12			

*Level Switches are numbered from top to bottom

Section 2

PROCESS CONTROLS

A. Control Panel Operations

The waste treatment system is controlled by a central control panel. This panel is designed to automatically control the individual components of the system. The waste treatment system equipment is activated by pushing the "Master Start" push button. This enables the automatic systems.

The following is a list of the switch positions in the automatic mode:

Function	Position
Mixers	On
Final Mixer	Auto
Sludge Blowdown	Auto
Lime Recirculation	On
Pump Alternator	On
Transfer Pump	Auto
Filter Pump	Auto
Sodium Hydrosulfite	Auto
Phosphoric Acid	Auto
Polymer	Auto
T2 Acid Feed	Auto
Final pH Acid Feed	Auto
Backwash Bleed	Auto
T3 Lime Feed	Auto
T4 Lime Feed	Auto
Recycle Water Pump	Auto
Sludge Recirculation	Auto

Note that some components can be run in manual mode by turning the selector switch to hand. The manual mode should only be used to test individual components.

B. Pumps

Transfer Pumps: Complexed process pumps 102 PW1 and 102 PW2

As the level rises in 105 T1, the individual level switches activate. When the level activates LS3, the lead pump is started. If the level continues to rise and LS2 is activated, the lag pump will then be activated. If the level continues to rise and LS1 is activated, the alarm circuit will be enabled.

Please note that anytime an alarm circuit activates, an audible alarm will sound and a light indicating the process failure location will be energized. Check trouble-shooting section for details.

As the level drops and LS2 and LS3 are deactivated, the lag pump will shut down. When LS4 is deactivated, the lead pump will shut down.

Chemical Feed Pumps

The chemical feed pumps are furnished with a 3-way valve on the pump discharge. This valve can be turned one way to direct the treatment chemical to the process tank and the other way to return the feed chemical back to the feed tank. To prime a pump, first be certain that the pump's local disconnect switch is in the "OFF" position. At the main control panel, turn the pump selector switch to "HAND". Next, turn the 3-way valve to the feed tank return position. Activate the pump by moving the disconnect switch to "ON". Turn the pump speed switch to 100% and adjust stroke, while pumping, to 100%. After the pump is primed, turn the 3-way valve to the process tank position and adjust the speed/stroke as needed. At the main control panel, turn the pump selector switch to the "AUTO" position. While calibrating pH meters, turn the chemical feed pump controlled by that meter to the "OFF" position until meter calibration is complete, then turn feed pump control to "AUTO" position.

Chemical Feed Systems

The chemical feed systems are equipped with individual polyolefin tanks of 110 gal. capacity, feed pumps (air or electric operation), and an interface to the corresponding Leeds & Northrup pH meter or level control as follows:

Chemical	Useage	Feed Pump	Control
Sodium Hydrosulfite	105T2	LMI D141-36	LS1 - LS4
Phosphoric Acid	105T2	LMI D141-36	LS1 - LS4
Lime	105T3-T4	Wilden M1	pH Meter
Polymer	105T5	LMI D131-36	LS1 - LS4
Sulfuric Acid	102T7	LMI D141-36	pH Meter

Chemicals that are controlled by LS1 - LS4 are interfaced with the complexed process pumps. Their corresponding feed pumps are operating 50% of the time when the lead pump is the only pump running and 100% of the time when both pumps are running.

Lime is recirculated utilizing a Wilden M1 pump and an electric mixer on the feed tank. Both pump and mixer must run continuously to limit calcification of chemical feed lines and solenoids. The lime feed to 105 T3 and 105 T4 is accomplished when their corresponding pH meter opens the solenoid assigned to the tank, diverting the lime flow into the tank.

The valves in the lime recirculation system should be adjusted to maintain 40 psi at the outlet of the pump and 30 psi on the return line to the feed tank. The valves on the lines entering the process tanks should be adjusted to prevent excessive swing in the pH meter readings.

The LMI pump on the sulfuric acid feed system should be adjusted to prevent excessive swing in the pH meter readings.

The chemical feed rates which are flow dependent are: phosphoric acid, sodium hydrosulfite, and polymer. The values given in chemical feed specifications are based on 85 gpm. If actual flow is less, adjust the feed rate based on the following formula:

$$\frac{\text{Flow (gpm)}}{\text{85 gpm}} \times \frac{\text{Chart value (gal)}}{\text{hr.}} = \text{gal/hr feed}$$

Refer to the Leeds & Northrup manual and pH meter/control alarm specifications for calibration of pH meters. Use standard buffer solutions of pH 4 and pH 7 to standardize the probe/meter in tank 105 T2, and buffers of pH 7 and pH 10 to standardize all other pH probes/meters.

pH Meter/Control Alarm Specifications

Tank	Control at Meter		Alarms inside Panel		
	Alarm 1	Alarm 2	Designation	Set Point A	Set Point B
105 T2	4.5-5.0	Not used	AAC1	3.5	6.0
105 T3	8.0-8.5	Not used	AAC2	7.0	9.5
105 T4	9.0-9.5	Not used	AAC3	8.0	10.5
102 T7	8.0-8.5	Not used	AAC4	6.4	9.2

Chemical Feed Specifications

Chemical	Makeup	Useage gal/hr				
		105 T2	105 T3	105 T4	105 T5	102 T7
Sodium Hydrosulfite	1 lb/gal	8.9				
Phosphoric Acid	Concentrate	1.5				
Lime	1 lb/gal		8.5	2.4	12.8	
Polymer	1 qt/100 gal					.1
Sulfuric Acid	Concentrate	1.2				

Timer Control Specifications

Chemical	Timer		Setting	
	Off	On	Off	On
Sodium Hydrosulfite	906	907		
Phosphoric Acid	908	909		
Polymer	910	911		

Note: When both complex process pumps 102 PW1 and 102 PW2 are running, off timer is deactivated.

D. Calibration of pH Meter

1) Rinse the tip of the pH probe in clean water
2) Place the tip of the probe in a fresh pH 7 buffer solution
3) Press the HOLD key once, a flashing hold indicator will appear on the meter
3) Press the STD/Slope key once, STD indicator will be displayed on the meter
4) Using up/down key, adjust the reading on the meter to 7.00
5) When 7.00 has been adjusted, press enter
6) Rinse the probe in clean water and place the tip in a fresh pH 4 or 10 buffer
7) Using up/down key, adjust the reading to 4.00 or 10.00, depending on the buffer used. Refer to chemical feed system for proper selection of buffer solutions
8) When the slope has been adjusted, press enter
9) Press HOLD button once. Hold will disappear from meter

Control Adjustments

1) Refer to pH meter/control alarm specifications and process as follows:
2) Enter Alarm 1 or Alarm 2 by pressing Alarm 1/Alarm 2 key to achieve correct display on meter
3) Press up/down key to achieve desired set points
4) After the proper set point is displayed, press enter

Alarm Adjustments

1) Using steps 3-5, adjust meter to set point in pH meter alarm specifications
2) Adjust set point A or set point B on GLI alarm modules as required to light the proper penlite inside the alarm module.
3) Adjust the readings on the pH meter up and down to verify alarm settings
4) Recalibrate the pH meter to pH 7 only using a pH 7 buffer

The waste stream flows by gravity from tank 105 T5 to 105 T6, which is inclined plate clarifier. The solids settle in the cone section and the clear liquid rises through the plate packs. The purpose of the plate packs is to break the upward velocity of the smaller particles that may be carried up by the waste stream. Once the small particles' upward velocity is broken, they settle into the sludge blanket. The sludge level in the cones is removed automatically by activating the sludge pump, which pumps the sludge to the thickening tank. At no time should the sludge level be allowed to touch the bottom of the plate packs (See trouble-shooting chart). The sludge level can be determined by pulling samples from the sample taps provided in the cones. The sample is to be pulled as follows:

1) Drain a one liter sample into a calibrated beaker and discard.

2) Drain a second liter sample into a calibrated beaker and let settle for ten minutes.

3) Measure sludge level in the beaker as compared to the total volume and convert to a %.

4) Compare to specifications as follows:

   a) Top Tap - Less than 10%
   b) Middle Tap - 40 to 50%
   c) Bottom Tap - 80 to 100%

Adjust the sludge blowdown timer/sludge pump as needed. A sludge recirculation pump is provided to recirculate a small portion of the sludge from the bottom of the clarifier. This aids in proper floc formation and reduction of sludge production.

F. Penfield Filter Operation

The operation of the pumps for the Penfield polishing filters are controlled by the level controls in 105 T7. A pump is activated when the level in 105 T7 activates LS6. If the level continues to rise and LS5 is activated, the alarm circuit will be enabled. If the level drops and LS7 is deactivated, the pump will shut down. The pump not assigned to filtration service will automatically be designated as the backwash service pump. Its associated valve will be automatically rotated to the backwash position.

The Penfield filters are interfaced with the main control panel to control the backwash cycle. If the differential pressure across a filter increases to a preset point, a backwash request will be initiated. When the backwash request is initiated, the backwash cycle will be activated when LS9 in 102 T14 is activated and LS 12 in 105 T13 is not activated. At this point, the recycle water pump will also be activated. The recycle pump will continue to run as long as LS9 in 102 T14 is not activated. A timer in the Penfield filter control unit will then control the backwash pump and its associated valving. When filter 105 F1A is finished backwashing, the filter 105-F1B will automatically initiate backwash when tanks 105-T13 and T14 have sufficient volumes available. After the second filter has backwashed itself, it will be returned to the service mode. Backwash cycle can also be initiated by depressing the manual backwash button on the Penfield control panels.

The backwash water will be directed to the backwash holding tank 102 T13. This water will be sensed by level switches LS 11 and LS 12. When LS 12 is activated, the bleed solenoid will be activated allowing the backwash water to flow to 105 T1. When LS 12 is deactivated, the solenoid will close, stopping the flow. The solenoid will also be closed if LS1 is activated in 105 T1 indicating a high liquid level alarm condition.

G. Drexelbrook Calibration

The height of the water above the V-notch weir in 102 EMS1 is sensed by the Drexelbrook probe and a signal is sent to the meter. The probe should be positioned so its tip is 1/4" below the bottom of the V-notch on the weir plate.

The zero adjustment should be made first with a zero flow condition. This is accomplished by adjusting the step zero to #1 position and adjusting the fine zero screw to obtain a 0 reading on the meter. After the zero flow adjustment has been set, start the flow through the weir. Allow sufficient time for the water level above the V-notch weir to stabilize, then measure the height to the nearest 1/8" and adjust the step and fine controls on the span to correspond to the calculated readings as shown on the attached chart.

A. Mechanical Trouble-Shooting Chart

Problem	Cause	Correction
Pumps not keeping up with flow @ 105 T1 (motors running)	A) Excessive flow over 85 gpm entering the system	A) Reduce flow to system
	B) Pump discharge valves not properly adjusted	B) Adjust discharge valves
	C) Pump impeller obstructed with foreign material	C) Remove foreign material
	D) Suction or discharge piping obstructed	D) Remove obstruction
Pumps not keeping up with flow @ 105 T1 (motors not running)	A) Pump selector switch or system start in "OFF" position	A) Turn pump selector switch to "AUTO" position. Depress "MASTER START" push button
	B) Level switches in tank not sending the proper signal to the control center	B) Check operation of level switches. Check cords for tangles or breaks in insulation. Make repairs as necessary
	C) Blown fuses	C) Isolate and repair cause of blown fuse. Replace blown fuses
	D) Defective motor starter	D) Repair or replace
	E) Motor overload tripped	E) Check overload setting against motor amp rating. Adjust if necessary. Reset motor overloads
	F) Remote disconnect open	F) Close disconnect switch
	G) Motor burned out	G) Isolate and remove cause of burnout. Replace motor

Mixers not agitating tank correctly (motor running)	A) Impeller not attached to shaft	A) Locate impeller and reattach to shaft
	B) Motor running backwards	B) Change rotation electrically
	C) Position of mixer incorrect	C) Reposition for maximum agitation
Mixers not running	A) Remote disconnect or system start switch turned in "OFF" position	A) Put remote disconnect in "ON" position. Depress "MASTER START" push button
	B) Motor overload tripped	B) Check overload setting against motor amp rating. Adjust if necessary. Reset motor overloads
	C) Defective motor starter	C) Repair or replace
	D) Blown fuse	D) Isolate and remove cause of blown fuse. Replace fuse
	E) Motor burned out	E) Isolate and remove cause of burnout. Replace motor
pH meter will not calibrate. (Check Leeds-Northrup Manual for further information	A) Probe defective	A) Replace
	B) Pre amp defective	B) Replace
	C) Defective meter	C) Repair or replace
Automatic sludge blowdown will not operate	A) Selector switch not in "AUTO" mode	A) Turn to "AUTO" mode
	B) Blown fuse	B) Isolate and repair cause of blown fuse. Replace fuse
	C) Defective Control Relay	C) Replace defective relay
	D) Timer 912 or 913 not properly set	D) Reset timers per specifications

Filter pumps will not keep up with flow into tank 105 T7. (Refer to pump problems already listed).	A) Filter blinded	A) Initiate filter backwash cycle manually

B. Chemical Trouble-Shooting Chart

Problem	Cause	Correction
Floc not forming properly	A) pH not within limits	A) Check pH meter operation and recalibrate/restandardize as necessary
	B) Insufficient or excessive polymer feed for flow rate	B) Check polymer feed pump rate and adjust to specifications
	C) Insufficient polymer in feed tank	C) Add polymer and water per specifications to feed tank
	D) Mixer in polymer feed tank left on, (shearing polymer)	D) Add polymer per specifications to feed tank and mix 15 minutes
	E) Insufficient phosphoric acid or sodium hydrosulfite feed for flowrate	E) Check feed pump rate and adjust to specifications
	F) Insufficient chemicals in feed tank	F) Add chemicals to feed tank per specifications
	G) Excess untreated cleaners entering the system	G) Decrease cleaner feed rate into treatment system
	H) Excessive oil entering system	H) Locate source of oil and remove from waste rinse stream
Clarifier Section cloudy or yellow	A) Floc not forming properly	A) See trouble-shooting section on floc formations
Excess floc rising through clarifier plate packs	A) Improper desludging of clarifier	A) Adjust sludge blowdown per specifications
	B) Incorrect polymer feed	B) Check polymer feed rate and adjust to specifications

	C) Plate packs dirty	C) Drain plate packs and clean
	D) Excessive waste stream flow	D) Reduce flow to design level
Low pH	A) Caustic feed tanks empty	A) Charge up caustic feed tanks
	B) Lime feed system not functioning	B) Check lime supply tank and fill if needed. Check lime feed valves, clean or repair as needed. Check air solenoid valves for clogging and clean or replace, as needed.
	C) Caustic feed pumps not pumping sufficient caustic to match flow	C) Increase caustic feed pump flow or decrease sump pump flow. Repair or replace damaged or worn caustic feed pump
	D) Excessive acid entering system	D) Locate source, take necessary corrective action at source, increase caustic feed pump flow rate and/or decrease sump flow
	E) Excessive metals entering system	E) Check process tanks and auxiliary equipment for leaks. Take necessary corrective action at source, increase caustic feed pump flow and/or decrease sump pump flow
	F) Set points on pH meter not properly adjusted	F) Recalibrate pH meter set points
	G) pH probe out of calibration	G) Clean and recalibrate. Replace pH probe if defective
High pH	A) Acid feed tanks empty	A) Fill up acid feed tanks
	B) Acid feed pumps not pumping sufficient acid to match flow	B) Increase acid feed pump flow and/or decrease sump pump flow. Repair or replace acid feed pump
	C) Excessive lime feed	C) Check lime feed valve air solenoids for proper operation. Repair as needed

	D) Excessive caustic entering system	D) Locate source, take necessary corrective action at source, and/or increase acid feed pump flow and/or decrease sump pump flow
	E) Set points on pH meter not properly set	E) Recalibrate pH meter set points
	F) pH probe out of calibration	F) Clean and recalibrate. Replace pH probe if defective
ph/ORP		
pH drift exessive	A) Excessive acid/caustic feed	A) Decrease feed pump rates
	B) Span adjustment on meter out of calibration	B) Recalibrate meter and reset span
	C) Dirty pH probes	C) Clean with 10% hydrochloric acid and soft cloth. Restandardize pH probe.

SECTION I

PROCESS DESCRIPTION

DEVELOP STRIP RINSE TREATMENT SYSTEM

The wave solder and surface mount rinse waste streams are pumped by air diaphragm pumps 108 PDI, 108 PD2 and 108 PD3 into the first stage wave solder reaction tank 107 T2. The air diaphragm pumps are manually activated by local disconnects. The function of this tank is to oxidize the organics in this stream which interfere with the subsequent processing steps. This is accomplished by mixing, adjusting the pH with sulfuric acid (H_2SO_4) and feeding Potassium Permanganate (KMMO4). The pH is sensed by a Leeds-Northrup pH meter which controls the sulfuric acid feed. The Oxidation Reduction Potential is sensed by a Leeds-Northrup ORP meter which controls the KMMO4 feed.

The waste stream then overflows to 107 T3. The function of this tank is to complete the oxidation step started in 107 T2. This is accomplished by mixing and feeding KMMO4 as in 107 T2.

The develop/strip rinses enter the Develop/Strip Rinse Collection Tank 107 T1 through a basket strainer. The level in this tank is sensed by level switches LS1-LS4. These level switches control pumps 107 PW1 and 107 PW2. In the event that these pumps fail to keep up with the incoming stream, an audible/visual alarm will be enabled.

The overflows from 107 T3 and 107 T1 are combined in 107 T4. The function of this tank is to prepare the metals in solution for the next pH neutralization step. The metals are prepared by mixing and adjusting the pH with sulfuric acid, adding phosphoric acid, and adding ferrous sulfate. A Leeds-Northrup pH meter is supplied to control the sulfuric acid feed system. Phosphoric acid and ferrous sulfate feeds are controlled by the level switches in the Develop Strip Rinse Collection Tank.

The waste stream from 107 T4 then overflows to 107 T5. The purpose of this tank is precipitation of the metals from the waste stream. This is accomplished by mixing and adding lime to elevate the pH. A Leeds-Northrup pH meter is supplied to control the lime feed.

The waste stream then overflows to the Flash mix/Flocculation Tank 107 T6. The purpose of this tank is to make the precipitate that was formed in previous tank grow in size to enhance the settling rate. This is accomplished by mixing and adding polymer. The polymer feed is controlled by a level switch in Rinse Collection Tank.

The overflow from 107 T6 enters the clarifier 107 T7. The purpose of this tank is separation of the solids formed in the previous operations. The solids settle into the cones and are automatically pumped to the Sludge Thickening Tank by an air diaphragm pump. A small stream of sludge will be recirculated to the 107 T6 by an air diaphragm pump. The purpose of this side stream is to assist in flocculation at times of low solids concentrations. The clarified water rinses through the plate packs and into the overflow troughs. Anti-Scale polymer is pumped into the overflow trough to prevent buildup in subsequent operations.

The waste stream then overflows to Water Collection Tank 107 T8. The purpose of this tank is to act as a reservoir for the polishing filter pumps. The polishing filter pumps 107 PW3 and 107 PW4 are controlled by level switches LS5-LS7. Refer to Phase I Process Description for further information.

SYSTEM COMPONENTS
DEVELOP/STRIP SYSTEM

Component Identification	Description
LS1 - LS7	B & O Level Switch
107 - PW1	Fybroc 1530
107 - PW2	Fybroc 1530
107 - PW3	Gould 3655
107 - PW4	Gould 3655
107 - PD1	Wilden M1
107 - PD2	Wilden M4
107 - PD5	Wilden M4
107 - MP1	LMI D141 - 36
107 - MP2	LMI D141 - 36
107 - MP3	LMI D141 - 36
107 - MP4	LMI D141 - 36
107 - MP5	LMI D141 - 36
107 - MP6	LMI D141 - 36
107 - MP7	LMI D141 - 36
107 - MP5	LMI A141 - 155
107 - MP6	LMI A141 - 155
107 - MP8	LMI A141 - 155
109 - MP1	LMI D141 - 36
107 - MX1	Lightnin XJ65
107 - MX2	Lightnin XJ230
107 - MX3	Lightnin XJ230
107 - MX4	Lightnin XJ230
107 - MX5	Lightnin XJ30
107 - MX6	Lightnin Mark 1
107 - MX7	Lightnin Mark 1
108 - MX8	Lightnin Mark 1
108 - PD1	Wilden M2
108 - PD2	Wilden M2
108 - PD3	Wilden M2
109 - PD1	Sandpiper SB1-A Type 2
109 - PD2	Wilden M2
pH Meter	Leeds & Northrup 7082-11
pH Probes	Leeds & Northrup 7777-1-1-08
ORP Probes	Leeds & Northrup 7777-1-1-08
Alarm Module	GLI 46-101

SECTION 2

PROCESS CONTROLS

A. Control Panel Operations

The waste treatment system is controlled by a central control panel. This panel is designed to automatically control the individual components of the system. The waste treatment system equipment is activated by pushing the "Master Start" push button. This enables the automatic system.

The following is a list of the switch positions in the automatic mode for Develop/Strip system:

Function	Position
Mixers	On
Pump Alternator	On
Transfer Pump	Auto
Filter Pump	Auto
Filter Service Pump Selector	PW-3 or PW-4
Permanganate OX 1	Auto
Permanganate OX 2	Auto
Sulfuric OX 1	Auto
Sulfuric pH Neutralization 1	Auto
Ferrous Sulfate	Auto
Polymer	Auto
Phosphoric Acid	Auto
Phosphoric Acid Bleach	Auto
Sulfuric Batch	Auto
Sludge Recirculation	Auto
Sludge Blowdown	Auto
Backwash Bleed	Auto
Concentrate Pump	Auto
Lime pH Neutraliztion 2	Auto

Note that some components can be run in manual mode by turning the selector switch to hand. The manual mode should only be used to test individual components.

B. Pumps

Refer to Complex Waste System Manual for typical pump operation.

C. Chemical Feed Systems

The chemical feed system is set up similar to that for the Complex Waste System.

Chemical	Useage	Feed Pump	Control
Phosphoric Acid	109-T-2	LMI D141-36	LS1-LS4
Phosphoric Acid	107-T-4	LMI D141-36	LS1-LS4
Permanganate	107-T-2	LMI D141-36	ORP Meter
Permanganate	107-T-3	LMI D141-36	ORP Meter
Sulfuric Acid	107-T-2	LMI D141-36	pH Meter
Sulfuric Acid	107-T-4	LMI D141-36	pH Meter
Ferrous Sulfate	107-T-4	LMI D141-36	LS1-LS4
Lime	107-T-5	Wilden M2	pH Meter
Polymer	107-T-6	LMI D141-36	LS1-LS4
Caustic Soda	102-T-2	LMI D141-36	pH Meter
Lime	102-T-2	Wilden M2	pH Meter
Lime	102-T-3	Wilden M2	pH Meter
Sulfuric Acid	102-T-3	LMI D141-36	pH Meter
Ferrous Sulfate	102-T-3	LMI D141-36	LS1-LS4
Polymer	102-T-4	LMI D141-36	LS1-LS4
Scale Retardent	102-T-5	LMI A141-155	LS1-LS4
Scale Retardent	105-T-6	LMI A141-155	LS1-LS4
Scale Retardent	105-T-7	LMI A141-155	LS1-LS4

pH/Orp Meter/Control Alarm Specifications

Tank	Control at Meter		Alarms inside Panel		
	Alarm 1	Alarm 2	Designation	Set Point A	Set Point B
107-T-2 pH		6.00	AAC - 1A	5.0 - 5.1	7.4 - 7.5
107-T-20 ORP	400		AAC - 2A		
107-T-30 ORP	50		AAC - 3A		
107-T-4 pH	9.0		AAC - 4A	7.9 - 8.1	10.5 - 10.6
107-T-5 pH	8.3	9.0	AAC - 5A	7.9 - 8.1	10.5 - 10.6
107-T-2 pH	8.3	9.0	AAC - 1B	7.9 - 8.1	10.5 - 10.6
107-T-3 pH	9.5	10.0	AAC - 2B	7.9 - 8.1	10.3 - 10.5

Chemical Feed Specifications

Chemical	Make Up	Useage Tank	Feed Rate ml/min@ ____ gpm
Phosphoric Acid	10% by volume	107-T-2	400 @ 125
	4 oz/gal TSP	109-T-2	As Needed
Potassium Permanganate	8 oz/gal	107-T-2	ORP Controlled
		107-T-3	ORP Controlled
Sulfuric Acid	Concentrated	102-T-3	pH Controlled
		107-T-2	pH Controlled
		107-T-4	pH Controlled
Ferrous Sulfate	8 oz/gal	102-T-3	1600 @ 125
		107-T-4	1600 @ 125
Caustic Soda Liquid 50%			
Polymer	Concentrated	102-T-2	pH Controlled
		102-T-4	800 @ 125
		107-T-6	800 @ 125
Scale Retardent	Concentrated	102-T-5	10 ml/min@ 85 gpm
		105-T-6	16 ml/min@ 135 gpm
		107-T-7	16 ml/min@ 135 gpm

Note - Experience with system operation may indicate further feed rate adjustment

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WASTE TREATMENT ANALYSIS LOG

OCATION	TIME	DATE	pH	Cu	Ni	Cr	Fe	Pb	Sn	COD	BOD	

WASTE TREATMENT OPERATIONS LOG

DATE	TIME	107-T-3ORP Meter	107-T-4pH Meter/Portable	107-T-5pH Meter/Portable	102-T-3pH Meter/Portable	102-T-4pH Meter/Portable

Problems/Corrective Action/Calibrations

WASTE TREATMENT OPERATIONS LOG

DATE	TIME	105-T-2 pH Meter/Portable	105-T-3 pH Meter/Portable	105-T-4 pH Meter/Portable	102-T-7 pH Meter/Portable	107-T-2 pH Meter/Portable	107-T-2 O Meter/Por

Problems/Corrective Action/Calibrations

WASTE TREATMENT CHEMICAL USEAGE

Feed Tank ID	Date	Time	Amt.	Manual Additions

PROCESS DUMP LOG

Line	Tank	Vol.	Date	Time	Comments/Authorization

WASTE TREATMENT CLARIFIER POLISHING FILTER

CLARIFIER					POLISHING FILTER				
Date	Time	Top Top	Middle Top	Comments	Date	Time	Pressure	Regernation	Comments/P

SECTION I

PROCESS DESCRIPTION

NON-COMPLEX ACID RINSE

The non-complex acid rinse stream enters the rinse collection tank 102 T1 through basket strainer. The level in the tank is sensed by level switches LS1-LS4. These level switches control the operation of the non-complex process pumps, 102 PW1 and 102 PW2. In the event that these pumps fail to keep up with the incoming stream, an audible/visual alarm will be enabled.

The non-complex process pumps transfer the collected waste rinses from tank 102 T1 to reaction tank 102 T2. The function of this tank is pH adjustment. This is accomplished by mixing and adjusting the pH with sulfuric acid or lime as required. The pH is monitored by a Leeds & Northrup pH meter, which controls the feed systems for sulfuric acid and lime.

The stream then flows by gravity to reaction tank 102 T3. The tank is flash mix/flocculation. The metal precipitate that has been formed by the previous operations is allowed to grow in size and weight by adding polymer in the flash mix area to enhance the settling rate. The polymerized stream is then gently mixed in the flocculation section to promote large floc particle growth.

After flocculation in 102 T4, the waste stream enters the clarifier 102 T5. The function of this tank is to accomplish liquid/solid separation. The solids settle into the bottom cones and the liquid rises through the plate packs and into the effluent launder. Anti-Scale polymer is pumped into the overflow trough to prevent scale buildup in subsequent operations. The solids are automatically removed by a sludge pump that is activated by a timer in the control panel. A sludge recirculation pump is also provided to assist floc formation by adding small amounts of settled solids to the flocculation section.

The waste stream then flows by gravity to tank 102 T6, which is the water collection tank. The function of this tank is to act as source reservoir for the polishing filter pumps. The polishing filter pumps and alarm system are activated by level switches LS5-LS7, which are located in tank 102 T6.

The polishing filter pumps transfer the treated water through the Penfield filters 102 F1A and 102 F1B to the final pH adjustment tank 102 T7. Refer to the Penfield O & M Manual and First Stage Process Description for further information concerning filter operations.

SECTION 2

PROCESS CONTROLS

A. Control Panel Operations

The waste treatment system is controlled by a central control panel. This panel is designed to automatically control the individual components of the system. The waste treatment system equipment is activated by pushing the "Master Start" push button. This enables the automatic system.

The following is a list of the switch positions in the automatic mode for the Non-Complexed system:

Function	Position
Mixers	On
Pump Alternator	On
Transfer Pump	Auto
Filter Pump	Auto
Filter Service Selector	Auto
Ferrous Sulfate	PW3 or PW4
Polymer	Auto
Sulfuric pH Neutralization 2	Auto
Caustic pH Neutralization 1	Auto
Sludge Recirculation	Auto
Sludge Blowdown	Auto
Backwash Bleed	Auto
Lime pH Neutralization 1	Auto
Lime pH Neutralization 2	Auto
Backwash Pump	Auto
Recycle Water Pump	Auto

Note that some components can be run in manual mode by turning the selector switch to hand. The manual mode should only be used to test individual components.

B. Pumps

Refer to Complex Waste System Manual for typical pump operation.

C. Chemical Feed Systems

The chemical feed system is set up similar to that for the Complex Waste System.

Chemical	Useage	Feed Pump	Control
Phosphoric Acid	109-T-2	LMI D141-36	LS1-LS4
Phosphoric Acid	107-T-4	LMI D141-36	LS1-LS4
Permanganate	107-T-2	LMI D141-36	ORP Meter
Permanganate	107-T-3	LMI D141-36	ORP Meter
Sulfuric Acid	107-T-2	LMI D141-36	pH Meter
Sulfuric Acid	107-T-4	LMI D141-36	pH Meter
Ferrous Sulfate	107-T-4	LMI D141-36	LS1-LS4
Lime	107-T-5	Wilden M2	pH Meter
Polymer	107-T-6	LMI D141-36	LS1-LS4
Caustic Soda	102-T-2	LMI D141-36	pH Meter
Lime	102-T-2	Wilden M2	pH Meter
Lime	102-T-3	Wilden M2	pH Meter
Sulfuric Acid	102-T-3	LMI D141-36	pH Meter
Ferrous Sulfate	102-T-3	LMI D141-36	LS1-LS4
Polymer	102-T-4	LMI D141-36	LS1-LS4
Scale Retardent	102-T-5	LMI A141-155	LS1-LS4
Scale Retardent	105-T-6	LMI A141-155	LS1-LS4
Scale Retardent	105-T-7	LMI A141-155	LS1-LS4

SYSTEM COMPONENTS

NON-COMPLEX SYSTEM

Component Index	Description
LS1 - LS12	B & O Level Switch
102 - PW1	Fybroc 1530
102 - PW2	Fybroc 1530
102 - PW3	Gould 3655
102 - PW4	Gould 3655
102 - PW5	Gould 3655
102 - PD1	Wilden M1
102 - PD2	Wilden M4
102 - PD5	Wilden M4
102 - MP1	LMI D141 - 36
102 - MP2	LMI D141 - 36
102 - MP3	LMI D141 - 36
102 - MP4	LMI D141 - 36
105 - PD5	Wilden M2
114 - PW1	Fybroc 1530
114 - PD1	Sandpiper SB1-A Type 2
102 - MX1	Lightnin XJ230
102 - MX2	Lightnin XJ230
102 - MX3	Lightnin XJ230
102 - MX6	Lightnin Mark I
102 - MX7	Lightnin 14Q1
pH Meter	Leeds & Northrup 7082-11
pH Probe	Leeds & Northrup 7777-1-08
Alarm Module	GLI 46-101
Pinch Valve	Red Valve 2600
Blowdown Valve	Aquamatic 427-FDV-SC

WASTE TREATMENT OPERATIONS LOG

DATE	TIME	105-T-2 pH Meter/Portable	105-T-3 pH Meter/Portable	105-T-4 pH Meter/Portable	102-T-7 pH Meter/Portable	107-T-2 pH Meter/Portable	107-T-2 Meter/P

Problems/Corrective Action/Calibrations

WASTE TREATMENT OPERATIONS LOG

DATE	TIME	107-T-30RP Meter	107-T-4pH Meter/Portable	107-T-5pH Meter/Portable	102-T-3pH Meter/Portable	102-T-4pH Meter/Portable	

Problems/Corrective Action/Calibrations

WASTE TREATMENT ANALYSIS LOG

LOCATION	TIME	DATE	pH	Cu	Ni	Cr	Fe	Pb	Sn	COD	BOD	

PROCESS DUMP LOG

Line	Tank	Vol.	Date	Time	Comments/Authorization

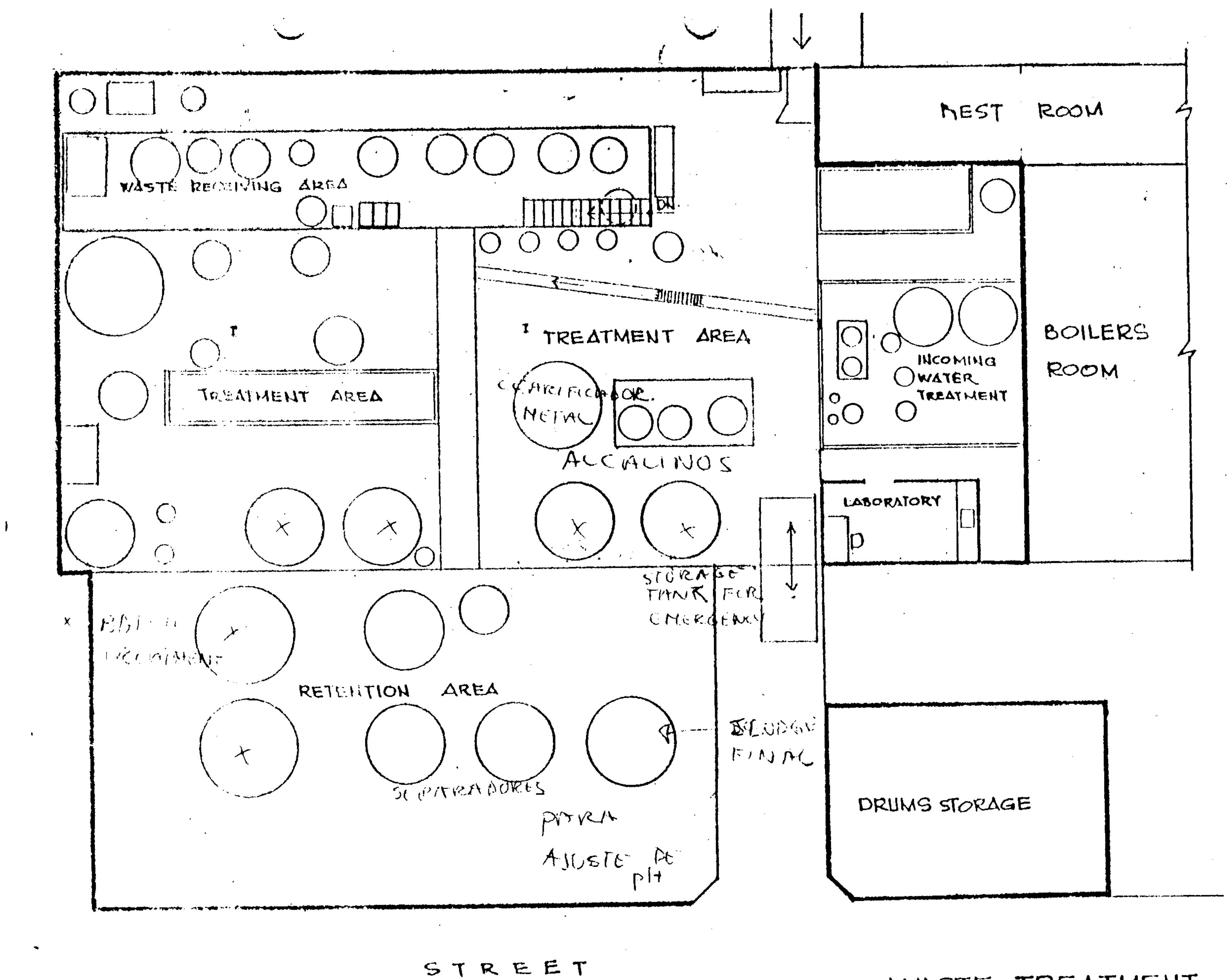
WASTE TREATMENT CHEMICAL USEAGE

Feed Tank ID	Date	Time	Amt.	Manual Additions

WASTE TREATMENT CLARIFIER POLISHING FILTER

CLARIFIER					POLISHING FILTER				
Date	Time	Top Top	Middle Top	Comments	Date	Time	Pressure	Regernation	Comments/F

EXHIBIT NO. 32



WASTE TREATMENT PLANT

SC. 1/16 = 1'-0"   8/26/80   S. VELAZQUEZ

EXHIBIT NO. 33

ESTADO LIBRE ASOCIADO DE PUERTO RICO / OFICINA DEL GOBERNADOR

Junta
de Calidad
Ambiental

20 de marzo de 1981

MEMORANDO

A	:	Ing. Luis E. De La Cruz, Director Programa de Contaminación de Terrenos
P/C	:	Ing. Carlos Ramírez, Director Negociado Desperdicios Peligrosos
	:	Sra. Rita Juliá, Jefe División Inspección y Vigilancia
	:	Sra. Olga Avilés, Jefe de Sección de Generadores
DE	:	Sr. Tomás Sanabria González Químico I
ASUNTO	:	Visita a Digital Equipment Corporation, San German, Puerto Rico.

El día 10 de marzo del año en curso, visité la compañía del epígrafe, localizada en la carretera #362, km 1.0, San Germán, Puerto Rico. La visita fue realizada en compañía de la Srta. Luz V. García, Químico I de la sección de facilidades.

El propósito de la visita fue entre otros, llenar el "RCRA Generator Inspection Checklist", realizar inspección general, además de orientar sobre el sistema del Manifiesto.

En la visita fui atendido por el señor Luis López, Ingeniero de planta de la compañía. De la entrevista con éste, se desprende la siguiente información:

1. Tipo de industria - Manufacturera de piezas electrónicas para computadoras.

Nos indica el señor López que entre los desperdicios que se genera hay un "slugde" proveniente de compuestos metálicos. Se genera una cantidad aproximada de 8,000-10,000 galones semanales.

El 12-15% es sólido y lo demás agua. Este es almacenado en un tanque del cual se recoge 3 veces en semana. Refiérase al apéndice #2 en donde puede verse claramente el área de almacenamiento. (Tanque de almacenamiento marcado con una X roja). Este desperdicio es dispuesto en el vertedero de Sabana Grande. Se le preguntó si se tenía autorización por escrito para disponer de este desperdicio en el vertedero, a lo que el señor López contestó que hace varios años atrás mediante comunicación telefónica se le autorizó a realizar esta operación en la manera que lo esta haciendo.

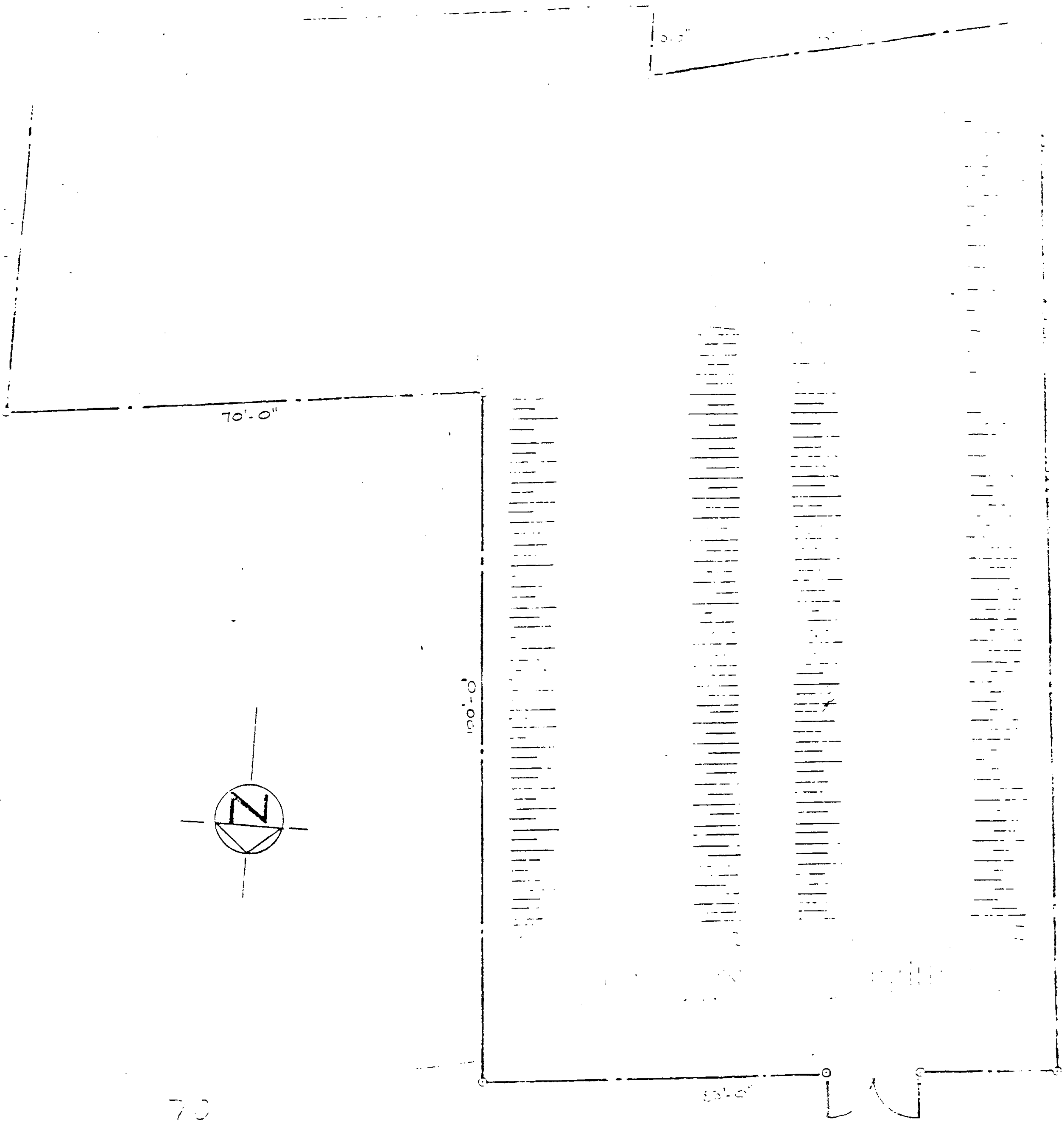
La persona a cargo del Sistema de Manifiesto es el señor Luis Ureta. Hablamos con éste para orientarlo ya que no hemos recibido ninguna copia de este documento. Al finalizar la orientación, el señor López nos aseguró que nos enviará copia de estos. Están utilizando el manifiesto enviado por nosotros (apéndice #3). Finalmente, procedimos a inspeccionar el área de almacenamiento en el vertedero de Sabana Grande. Refiérase al apéndice #1, en donde puede verse las dimensiones de esta área, asignada para la disposición de este desperdicio. Esta área no cumple con las estipulaciones requerida por la Agencia Federal y/o Junta de Calidad Ambiental.

Este caso esta en manos de la Srta. Mayra Pérez, Geóloga de la sección de facilidades y el señor Julio Díaz, Ingeniero Químico. Sobre el particular, fueron informados, ya que la inspección fue realizada en compañía de la Srta. García de la misma sección.

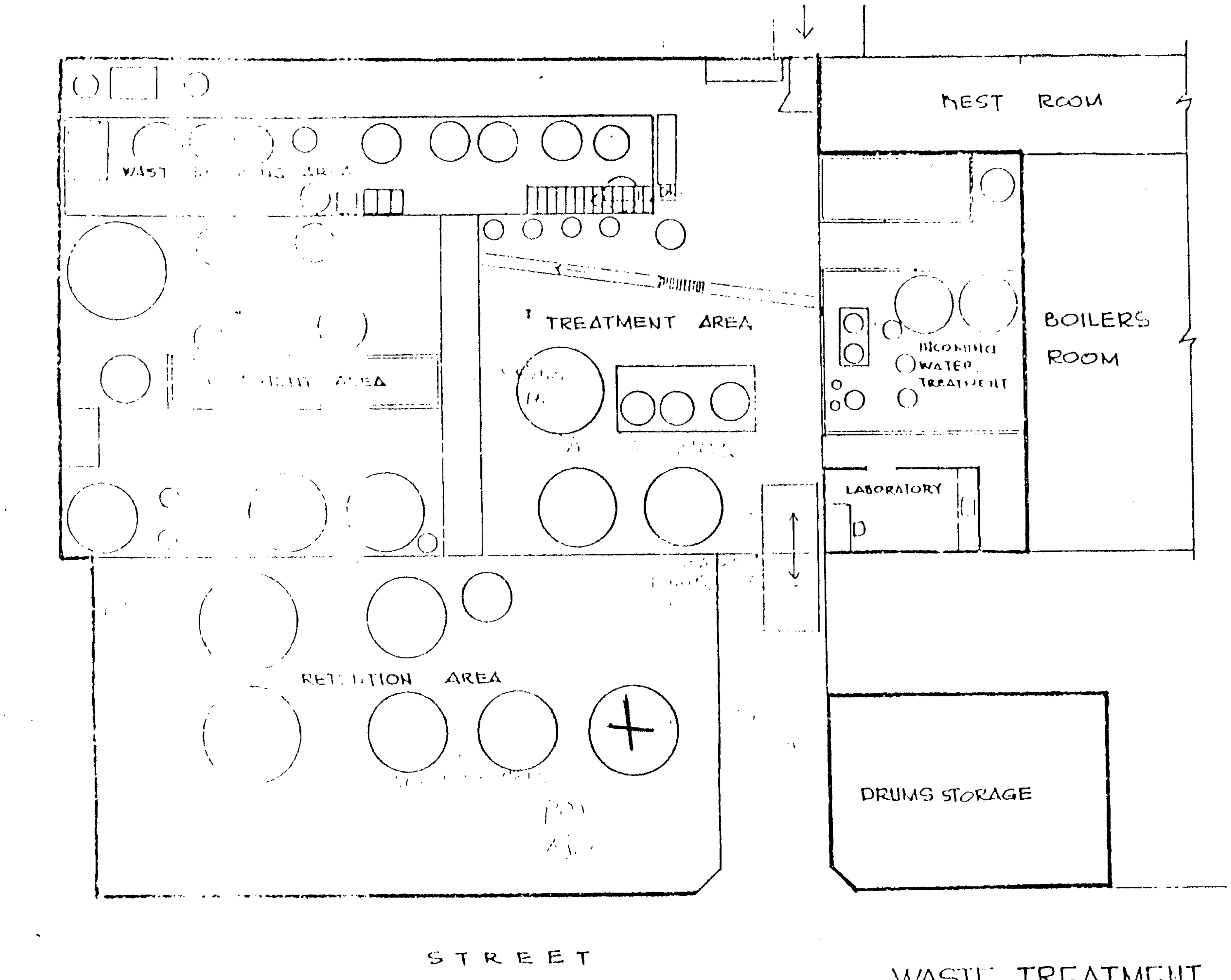
Lo anterior se lo informo para su conocimiento.

TSG/TSG

anejos



D.E.C SLUDGE DUMPING SITE
SC. 1"=40'-0"



WASTE TREATMENT PLANT

SC. 1/16 = 1'-0"　8/26/80　S. VELAZQUEZ

See cover sheet for instructions
1SE TYPE

DIGITAL EQUIPMENT CORPORATION

HAZARDOUS WASTE MANIFEST

digital

PART A:

DOCUMENT NO. P. R.

		EPA ID NO.
GENERATOR NAME	PHONE	
SITE ADDRESS		
TRANSPORTER NO. 1	PHONE	
SITE ADDRESS		
TRANSPORTER NO 2	PHONE	
SITE ADDRESS		
TREATMENT, STORAGE OR DISPOSAL (TSD) FACILITY	PHONE	
SITE ADDRESS		

IF MORE THAN TWO TRANSPORTERS ARE TO BE UTILIZED, FILL OUT THE FOLLOWING AS APPROPIATE

THIS FORM IS NO. ———— OF A TOTAL OF ——— THE FIRST MANIFEST DOCUMENT NO. IS. P. R.

TO BE FILLED OUT BY GENERATOR

PROPER US DOT SHIPPING NAME	US DOT HAZARD CLASS	UN NUMBER	FORM	NET QUANTITY	UNITS	CONTAINERS NO.	CONTAINERS TYPE	EQB EPA HAZ CODE	EQB/EPA WASTE TYPE
2									
3									
4									
5									
6									

SPECIAL HANDLING INSTRUCTIONS INCLUDING CONTAINER EXEMPTION (i.e. IDENTIFICATION OF ADDITIONAL WASTES INCLUDED IN SHIPMENT OF A NONHAZARDOUS NATURE WHICH DO NOT HAVE TO BE MANIFESTED)

GENERATOR'S CERTIFICATION: This is to certify tha the above named materials are properly classified, described, marked and labelled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. U.S. EPA and the Commonwealth of P.R. The waste described above were consigned to the Transporter named. The Treatment, Storage or Disposal Facility can and will accept the shipment of hazardous waste, and has a valid permit to do so. I certify that the foregoing is true and correct to the best of my knowledge.

GENERATOR'S SIGNATURE	TITLE	DATE SHIPPED (MO DAY YR)	EXPECTED ARRIVAL DATE (MO DAY YR)
TRANSPORTER NO. 1 SIGNATURE "To the best of my knowledge the contents of the shipment I have accepted for transport conforms with the description on this manifest."	TRANSPORTER NO. 1 VEHICLE ID. NO.		DATE RECEIVED (MO. DAY YR.)

TEAR AT THIS PERFORATION

GEN EPA ID#

PART B

TO BE FILLED OUT BY TRANSPORTER

TRANSPORTER NO. 1 SIGNATURE "I certify that I have not tampered with or materially altered the contents of this shipment."		DATE DELIVERED (MO DAY YR)
TRANSPORTER NO 2 SIGNATURE "To the best of my knowledge the contents of the shippment I have accepted for transport conforms with the description on this manifest."	TRANSPORTER NO 2 VEHICLE ID NO	DATE RECEIVED (MO DAY YR)
TRANSPORTER NO. 2 SIGNATURE "I certify that I have not tampered with or materially altered the contents of this shipment."		(MO DAY YR)

TO BE FILLED OUT BY TSD FACILITY

TREATMENT STORAGE OR DISPOSAL FACILITY INDICATION OF ANY DIFFERENCES BETWEEN MANIFEST AND SHIPMENT OR LISTING OF REASONS FOR AND DISPOSITION OF REJECTED MATERIALS

HANDLING METHOD

1	2
3	4
5	6

TRATMENT STORAGE OR DISPONSAL FACILITY SIGNATURE "Upon visual inspection, I certify that the contents of this shipment conform with the description on this manifest except those discrepancies noted on this form"

DATE RECEIVED (MO. DAY YR)

In case of emergency or spill immediately call the Environmental Quality Board (809) 725-8992

DOCUMENT NO. P. R.

EXHIBIT NO. 34

No: OAC 406/74

12 de agosto de 1974

Sr. Gerardo E. Maldonado
Director
Investigaciones Industriales
Compañía de Fomento Económico
Apartado 3086
San Juan, Puerto Rico 00936

Re: DIA Final JCA 73-054 (AFE)
Expansión de Digital
Equipment Corporation
San Germán, P. R.

Estimado señor Maldonado:

La Junta de Calidad Ambiental (JCA) ha revisado la Declaración de Impacto Ambiental (DIA) Final del proyecto mencionado en el epígrafe. Estimamos que los aspectos ambientales han sido evaluados en su medida, no obstante, deseamos emitir las siguientes recomendaciones:

I Uno de los problemas básicos que presenta este proyecto es el manejo y disposición final de los cienos digeridos resultantes del tratamiento de los afluentes del proceso industrial. Por su composición y características estos cienos presentan posibles problemas de contaminación de los suelos y de las aguas subterráneas y superficiales, dando lugar a posibles daños a la vida acuática y aumentando la concentración de los metales pesados en las aguas.

Entre las alternativas a considerarse para el tratamiento de estos cienos se incluyen:

1) La incineración y almacenamiento adecuado de las cenizas.

2) Embarque de los cienos a los Estados Unidos.

3) Tratamiento que pueda rendir los cienos secos de manera que estos puedan ser depositados en un sistema de relleno sanitario.

El Municipio de San Germán, donde actualmente se depositan los cienos de la planta que está en operación, posee un vertedero que opera en violación a nuestra reglamentación y cuyos terrenos colindan con una quebrada a donde prácticamente van a dar los desperdicios sólidos.

Sr. Gerardo E. Maldonado
DIA Final JCA 73-054 (AFE)
Página 2

12 de agosto de 1974

Por tales motivos, deseamos indicar que se deberá descontinuar el depósito de estos cienos en el vertedero de San Germán. De el proponente optar por utilizar el sistema de relleno sanitario de otro municipio, como lo podría ser el de Mayaguez, deberá obtenerse la autorización de las Autoridades Municipales correspondientes.

II Los cristales de sulfato de cobre que se recuperan son de propiedades tóxicas y los mismos pueden ser devueltos al proceso industrial de la planta o enviados a una firma que procese este material.

III La compañía encargada de la recolección y disposición de los desperdicios sólidos deberá estar autorizada por esta JCA.

En caso de surgir alguna duda sobre el particular, favor de comunicarse con nuesta División de Desperdicios Sólidos.

Cordialmente,

Carlos M. Jiménez Barber
Director Ejecutivo

OAC/ILC/cp

EXHIBIT NO. 35

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE August 31, 1984

SUBJECT Hazardous Waste Shipment from Digital, San Germán

FROM Carlos E. O'Neill, P.E., Environmental Engineer, Caribbean Field Office

TO John Jiminez, Environmental Scientist, Solid Waste Branch, Air & Waste Management Division

INSPECTION REPORT

On August 29, 1984, an inspection was made at Servicios Carbareon, Inc. (SCI) PRD #91-01-8622 and at the Ponce Port facilities operated by Mr. Luis Ayala Colón where the Ship "Seaport-Peder-Most" was anchored and receiving hazardous waste from Digital Corporation.

Digital operates a production facility located at Route 362, Kilometer 10, San Germán, Puerto Rico. By notification dated August 18, 1980, Digital informed EPA that it conducts activities at the facility involving "hazardous waste" as defined in 40 CFR §261.3. EPA I.D. number for this facility is PRD 991-29-1857. By application dated November 19, 1980 Digital requested a permit to conduct its hazardous waste activities. Digital also operates a disposal facility located at Route 268, Kilometer 2.4, Sabana Grande, Puerto Rico. By notification dated August 18, 1980, Digital informed EPA that it conducts activities at this facility involving "hazardous waste" as defined in 40 CFR §261.3. EPA I.D. PRD 000-70-6333. By application dated November 19, 1980 Digital requested a permit to conduct its hazardous waste activities.

Digital identified at both facilities a waste as F006 - wastewater treatment sludges from electroplating operations. On or about March 1981 Digital submitted a delisting petition to EPA headquarters in Washington. No answer from EPA has been received by Digital, to grant or deny the petition. Waste analysis performed by Digital indicated that the waste does not exhibit the characteristics of ignitability, corrosivity, reactivity and/or EP toxicity as defined by 40 CFR §261.21, 261.22, 261.23 and 261.24

On or about September 1983 Digital contracted SCI's services to remove the electroplating sludge from the surface impoundments at Sabana Grande facility and from their plant at San Germán. This sludge, in a dry appearance, was packed into 1 cubic yard plastic bags and transported to SCI facilities at Peñuelas.

SCI transportation and TSDF number under RCRA was identified from manifest documents as PRD 091-01-8622. This waste in plastic bags was stored at SCI hazardous waste storage areas on a temporary basis. A total of 1000 ton and in 1 cu yards bags were removed from Sabana Grande site. SCI also removed hazardous waste in 1 cu yard bags from Digital in the San German plant at an average rate of one per month.

On or about August 6, 1984 SCI, under instructions of Digital, started to transport the hazardous waste from the SCI facility to a warehouse operated by Mr. Luis Ayala Colón at the Port of Ponce. Luis Ayala Colón operates the warehouse and provides import/export services and port facilities to shippers. Luis Ayala Colón was contracted by Digital to provide services for the storage and loading of hazardous waste onto a ship anchored in the bay. The ship receiving the hazardous waste was identified as "Seaport-Peder-Most" and acted as a transporting vehicle of hazardous waste within the meaning of 40 CFR §263.10. At the time of the inspection this ship did not have an EPA I.D. number as required by 40 CFR §263.11; therefore, it was in violation of this section. On August 30, 1984 Peder-Mosts' Captain applied for an EPA Identification number. EPA issued an I.D. number to Peder-Most as a transporter. The number issued was PRD 980-52-6313.

Hazardous waste was transported to the port warehouse where it was stored prior to loading on the cargo ship. Manifest documents showed that the waste was received at the warehouse on the following schedule:

Date	Waste Load Received *
August 6, 1984	101 bags
August 7, 1984	180 bags
August 8, 1984	78 bags
August 22, 1984	60 bags
August 24, 1984	91 bags
August 27, 1984	89 bags
August 28, 1984	88 bags
August 29, 1984	54 bags

During the day of the inspection about 400 bags were found to be stored at the warehouse waiting to be loaded into the cargo ship.

* Each bag contains an average of 1 ton of hazardous waste.

COPY

Findings revealed that the second transporter, "Seaport-Peder-Most," had stored hazardous waste in excess of 10 days in violation of Section 40 CFR §262.30. The storage of hazardous waste in a non-approved facility constitutes a violation of 40 CFR Parts 270, 264 and 265.

The owner and operator of the cargo ship and its address is the following:

PARTREDERIET - SEAPORT
KULLINGGADE - 29-DK-5700
SVENDBORG, DENMARKT
PHONE: 921-0022

The operator of the port facilities including the warehouse, and its address is the following:

Sucesores Luis Ayala Colón
P.O. Box 7076
Ponce, Puerto Rico 00731
Phone: (809) 744-4343

Findings:

1. There is a question as to whether the bags used by Digital to pack the waste meets the packaging requirements under 40 CFR §262.30 and 49 CFR parts 173, 178 and 179. Therefore, Digital may found to be in violation of the packaging requirements under 40 CFR §262 subpart C - Pre-transportation requirements.

2. Digital offered hazardous waste for transportation to an off-site facility using a transporter which did not have an EPA Identification number, and therefore, Digital was found to be in violation of 40 CFR §262.12(c).

3. PARTREDERIET-SEAPORT-PEDER-MOST, acting as a second transporter of hazardous waste, did not have an EPA Identification number as required by 40 CFR §263.11 and therefore, was found to be in violation of this section.

4. PARTREDERIET-SEAPORT-PEDER-MOST, used the port facilities at Ponce as a transfer station for more than 10 days. The port facilities, including the cargo warehouse used to temporarily store the waste, is under the operation of Sucesores Luis Ayala Colón. The storage of hazardous waste in a transfer station in excess of 10 days is subject to regulations under 40 CFR Parts 270, 264 and 265. Since Peder-Most

and Sucessores Luis Ayala Colón did not had a permit for the storage of hazardous waste, they were found to be in violation of 40 CFR Parts 270, 264 and 265.

Inspection Report Prepared by:

Carlos E. O'Neill, PE.

CARLOS E. O'NEILL, P.E.,
ENVIRONMENTAL ENGINEER
CARIBBEAN FIELD OFFICE
(2-CA)

cc: Luis De La Cruz, EQB

EXHIBIT NO. 36

ESTADO LIBRE ASOCIADO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

IN RE:	CASO NUM: PRD-991291857
DIGITAL EQUIPMENT CORP.	SOBRE: ORDEN DE HACER Y DE MOSTRAR CAUSA
Querellado	REF: DL-88-004-007
	R-88-15-4

RESOLUCION Y NOTIFICACION

En reunión celebrada el 25 de mayo de 1988 se sometió a la consideración de la Junta de Calidad Ambiental la estipulación suscrita con DIGITAL EQUIPMENT CORPORATION----- relacionada con una Orden de Hacer y Mostrar Causa por alegadas violaciones al Reglamento para el Control de los Desperdicios Sólidos Peligrosos y No-Peligrosos, según enmendado.

Luego de discutidos todos los méritos de este caso y al amparo de los poderes y facultades que le confiere a esta Junta de Calidad Ambiental la Ley Número 9 del 18 de junio de 1970, Ley Sobre Política Pública Ambiental, según enmendada, por la presente se aprueba la estipulación en todas sus partes, copia de la cual se acompaña para que forme parte de esta Resolución. Se ordena el pago de $1,000.00, según estipulado.

NOTIFIQUESE por correo certificado con acuse de recibo a: Lcdo. Francis Torres, Goldman & Antonetti, Apartado 13486, Santurce, Puerto Rico 00908; y personalmente a los siguientes funcionarios de la Junta de Calidad Ambiental: Dr. Heriberto Torres, Vicepresidente; Lcdo. Carlos Vázquez, Miembro Asociado; Sr. Héctor Fuentes, Miembro Alterno; Lcdo. Pedro A. Maldonado, Asesore Legal; Lcdo. Pedro Reyes, Abogado del Interés Público: Sra. Flor del Valle, Directora Area Control Contaminación de Terrenos; y a la Lcda. Norma Morales de Sánchez, Directora Oficina Oficiales Examinadores.

DADA en San Juan, Puerto Rico, a 25 de mayo de 1988.

SANTOS ROHENA BETANCOURT
Presidente

CERTIFICACION

CERTIFICO que la presente es copia fiel y exacta del original que obra en el Archivo de Secretaría de esta Junta ... En San Juan, Puerto Rico, hoy ...

ESTADO LIBRE ASOCIADO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

IN RE:	CASO NUM.: PRD-091291857
DIGITAL EQUIPMENT CORP.	SOBRE: ORDEN DE HACER Y DE MOSTRAR CAUSA
Querellada	NUM.: DL-88-004-007

* * * * * * * * * * * * *

ESTIPULACION

POR CUANTO, el 8 de febrero de 1988 la Junta de Calidad Ambiental (en adelante la "Junta") emitió una Orden de Hacer y de Mostrar Causa (en adelante la "Orden"), copia de la cual se incluye a continuación como Anejo A, dirigida a Digital Equipment Corp. (en adelante "Digital") alegando que en inspección llevada a cabo el 30 de junio de 1987, personal técnico de la Junta evidenció una violación por Digital a la Regla 704-D(1) (b) (3) (almacenamiento desperdicios flamables a menos de 50 pies del límite de propiedad) del Reglamento para el Control de los Desperdicios Sólidos Peligrosos y No Peligrosos, versión enmendada (en adelante el "Reglamento").

POR CUANTO, Digital notificó a la Junta, mediante comunicación fechada el 6 de octubre de 1987, la relocalización del área de almacenamiento de los desperdicios peligrosos flamables en cumplimiento de la Regla 704-D(1) (b) (3). Dicha relocalización fue verificada por personal técnico de esta Junta.

POR CUANTO, Digital y la Junta (conjuntamente las "Partes"), a través de sus respectivos abogados, desean llegar a este acuerdo para estipular, transar y disponer de todas las alegaciones cubiertas en la Orden y así evitar la tardanza y los costos que resultarían de los procedimientos administrativos relacionados con la Orden.

POR TANTO, las Partes acuerdan lo siguiente:

1. Digital acepta y reconoce la jurisdicción de la Junta en este caso y queda obligada a cumplir con todas y cada una de las cláusulas vertidas en esta Estipulación y en la Resolución a

ser emitida por la Junta a tenor con la presente Estipulación. Además, reconoce y acepta que el incumplimiento de cualquiera de las condiciones en este documento podrán dar lugar a la imposición de sanciones que provee la Ley Sobre Política Pública Ambiental, Ley Número 9 del 18 de junio de 1970, según enmendada.

2. Esta Estipulación contiene todos los acuerdos entre las partes, excepto en la medida que aquí se exprese lo contrario y la misma no será efectiva ni obligará a las partes sino desde la fecha en que sea formalmente aprobada y adoptada por la Junta.

3. Esta Estipulación y la Orden constituyen el récord de este caso que será sometido a la Junta, la cual podrá adoptar la Estipulación mediante Resolución y Orden al efecto.

4. En consideración a esta Estipulación, Digital pagará a la Junta la suma de MIL DOLARES ($1,000.00) en transacción y relevo a todos los asuntos cubiertos en la Orden y en la Estipulación. Esta transacción incluye la multa, gastos y costas incurridos por la Junta relacionados con la Orden y este procedimiento.

5. La Junta acepta el pago por parte de Digital como transacción de la violación que se alega en la Orden y da por terminada esta acción administrativa de acuerdo a los términos y condiciones que aquí se establecen.

6. Digital se compromete a realizar el pago aquí acordado de MIL DOLARES ($1,000.00) dentro de los treinta (30) días siguientes al recibo por Digital de la Resolución de la Junta aprobando esta Estipulación. Evidencia de dicho pago será enviada al Representante del Interés Público dentro del mismo plazo de treinta (30) días.

7. Esta Estipulación será válida y aplicable a las Partes tan sólo si la misma es adoptada en su totalidad por la Junta.

8. El otorgamiento de esta Estipulación o la Resolución final que adopte la Junta, no constituye impedimento alguno para que la Agencia de Protección Ambiental, pueda, si así lo estima apropiado, exigir responsabilidad por violaciones a las leyes

y/o reglamentos federales basada en los hechos alegados en la Orden.

9. Digital se reserva el derecho de levantar ante cualesquiera personas y/o entidades y/o agencias estatales y federales, las defensas de hecho y de derecho que tenga contra las aseveraciones expuestas en la Orden. En dicho caso, esta Estipulación no se considerará una admisión por Digital de los hechos alegados en la Orden.

10. Determinan las Partes que esta Estipulación resulta en el interés público y una Resolución apropiada de los hechos expuestos en la Orden.

Las partes respetuosamente le solicitan a la Junta que adopte esta Estipulación como ha sido presentada.

En San Juan, Puerto Rico, a 5 de mayo de 1988.

DIGITAL EQUIPMENT CORP.

Lcdo. Francis Torres
Goldman & Antonetti
Apartado postal 13486
Santurce, Puerto Rico 00908

JUNTA DE CALIDAD AMBIENTAL

Lcdo. Pedro Reyes Bibiloni
Representante del Interés Público

Sra. Flor del Valle
Directora
Area Contaminación de Terrenos

APPENDIX A:

RFA'S INSPECTION REPORT

DIGITAL EQUIPMENT CORP.

SAN GERMAN, P.R.

MAY 17, 1990

[illegible] 17, 19[illegible]

TO : Ms. Flor del Valle
Director
Land Pollution Control Area

Flor del Valle

THROUGH : Mr. Carlos M. Martínez CM
Acting Director
Hazardous Wastes Division

BY : Aida T. Fuentes Rivera
Junior Environmental
Sciences Specialist

SUBJECT : RCRA Facility Assessment's
Inspection Report
Digital Equipment Corp.
San Germán, Puerto Rico
PRD091291857

As part of the RCRA Facility Assessment (RFA) performed to Digital Equipment Corp., San Germán, a preliminary visit and a visual site-inspection were conducted by EQB personnel on August 2nd, 1989 and February 20, 1990, respectively.

The following EQB personnel met with Mr. Angel Serrano of Digital, San Germán:

Date	Personnel
August 2nd, 1989	Yamira L. Rivera Rivera Aida T. Fuentes Rivera
February 20, 1990	Néstor M. Rivera Guzmán Aida T. Fuentes Rivera

During the Preliminary Visit, purposes and scope of the RFA process were explained to the facility representatives. The Facility RFA Response letter was handed in to Mr. Serrano. The manufacturing processes were explained to the EQB personnel and the process areas were visited.

During the Visual Site Inspection performed on February [illegible], 1990 a meeting was held among EQB personnel, Mr. Angel Serrano from Digital, Alberto Leon and José J. Rivera from Pedro Panzardi and Associates in order to discuss the Notice of Deficiencies (NOD) on the Closure Plan submitted by Digital. The remedial action at the Underground Tanks Area was also discussed with Mr. Serrano and Mr. Américo Abadía. Information about the facility was completed and company's files revised, some process areas were re-visited and photos Solid Waste Management Units (SWMU's) and Areas of Concern (AOC) were obtained.

Digital Equipment Corp., San Germán started operations in 19[illegible]. It is engaged in the manufacture of printed circuit boards for computers. The finished computer assembly is performed at the Aguadilla Plant of the Digital Caribbean Manufacturing Facilities.

Digital, San Germán has a TSD interim status permit but it is submitting a Closure Plan for its Hazardous Waste Container Storage Area (HWCSA) in order to apply for declassification of its present status (Generator, Treater/ Storer/Disposer Facility) to Generator only. Another HWCSA has been habilitated by the company for less than 90-day storage of hazardous wastes while the area to be closed will be used for storage of raw material, as a mechanics shop, and others miscellaneous uses.

It should be pointed out though that the company had an F006 waste Storage Tank (3,000 gallon) which was reported on the original Part A permit application as a RCRA unit. At present, the Storage Tank is part of the company's new Wastewater Treatment Plant and is used to feed the filter press of the Plant. A closure plan has never been submitted for the unit. Another smaller tank was also used for storage of F006 sludge and is now used for filters backwash in the Wastewater Treatment Plant.

The company had four (4) underground tanks for storage of diesel which were removed in 19[illegible] and two (2) aboveground storage tanks were placed instead at the same area. The Underground Injection Control (UIC) permit no. 84-0018 is still in force since declassification will be subject to completion of a remedial action undergoing at the Underground Tanks area.

The company has a permit for emissions (PFE) which expires on November 13, 1991 (PFE-64-0485-0348-I-II(O)). Another permit (PFE-LC-RM-64-0190-0346-I-II-O) which expires on January 24, 1992 has been issued in order to include additional emissions sources. Copies of both permits were provided to us by the company (refer to Attachment no.1).

The company has no NPDES permit because effluents are directly discharged to a POTW of the PRASA. However, the company has a Wastewater Treatment Plant classified as a metal finishing plant which has to comply with eight metal monitoring requirements on 40 CFR 433 and PRASA Pre-Treatment requirements (1[illegible] parameters). Metal monitoring includes: monitoring for total copper (Cu), total Chromium (Cr), total Silver (Ag), Total Nickel (Ni), total Cadmium (Cd), and total Cyanide (Cn). Twice in a year a Total Toxic Organic (TTO) test is performed.

The two main processes performed at the company are the manufacturing of the printing circuit board, and the module assembly.

The circuit boards are manufactured by a chemical process as follows:

1) Laminates which will form an inner layer (a nine to ten layers printed circuit) are made using the raw materials which are Copper Foil and 18" x 24" drilled Fiberglass layers. The Copper Foil is washed using a scrubber with a solution of sulphuric acid, 1% and rinsed with water. The rinsewaters are discharged to the company's Wastewater Treatment Plant.

A chemical clean will be used instead of the scrubber in the Inner Layer Room which has an acid-proof (Sulphuric Acid, 90%) floor and has a trench discharging to the Wastewater Treatment Plant.

2) Application of an image onto the layers using Ultraviolet (UV) light and acrylic is performed in the Dry Film Area. Image is developed using an ultraviolet (UV) developer made of Soda Ash and water.

3) Copper on the layers is removed using an etcher solution which consists of Ammonium Chloride and Ammonium Gas. Applied image stayed on layers. The Etcher Room has a strong ammonia odor.

4) Undesirable film on layers is removed by stripping with monoethanolamine.

5) Layers surface are oxidized at the Surface Treatment area. A Brown Oxide solution is used for oxidation. Layers are rinsed with an acidic media, Sulphuric Acid, 10%. The Surface Treatment Area has extractors.

6) A pre-prepared inner layer (nine to ten layers) is placed on a press and compressed during the Lay-up process. A printed circuit board is produced. The Press System Area has a cold press and a hot press. A metal scrap is generated.

7) After the inner layer is manufactured, a second process of drilling begins. The printed circuit board is drilled in order to make the holes that were originally on the board.

8) The drilled holes on the boards are cleaned into a Potassium Permanganate or Sodium Permanganate bath. Rinsewaters are generated. In the Drilling area, there is an X-Ray machine to inspect the product. Personnel that works in the X-Ray area is monthly monitored with a batch.

9) The boards are passed through an electroless process in order to cover the walls of the holes with a Copper solution for conductivity purposes. In the Electroless area, the boards are examined by cross-section. Formaldehyde is used as a catalytics for copper deposition. Copper generated in the electroless process is being currently recovered with a close-loop filters system. Water is now reused and not discharged to the Wastewater Treatment Plant. Copper Sulfate Crystals (D002 waste) and spent filters (D008/D002 waste) are generated from the recovery process.

10) Using a dry film, an image of lines is applied to the boards.

11) The boards are electroplated with copper, lead, tin and nickel. In the Electroplating Area, three thousands (3,000) boards are daily electroplated. Sulphuric and Fluoboric acid are used as acidic media for the metals baths. Hydrogen Peroxide is used for cleaning purposes. The tin and lead solutions are polished prior to enter the electroplating process in a close-loop Carbon Treatment unit at the Electroplating Area. The spent tin and lead solutions are regenerated through a filters system located also at the Electroplating Area. The spent filters are discarded as hazardous wastes. Generated Circuit Boards Scrap is accumulated and sold.

12) After the electroplating, the boards are microplated with nickel and gold. Nickel is generated from bath maintenance of the microplating.

13) The boards go through the final process which include melting and application of either a paste in the Solder Mask process or a dry film in the Dry-Film Solder Mask process. The paste and the dry-film are used to protect the board from scratches or dirt. The 1,1,1 trichloroethane is used in the Dry Film process for cleaning purposes into a close-loop bath. Waste 1,1,1 trichloroethane is generated from the process. In the Solder Mask process, Acetone is used for cleaning purposes, however, at present, its use has decreased. Waste Acetone is generated from the process.

Once the boards are manufactured through the chemical process at the Printing Circuit Facility (PCF), the printed circuit boards are used as raw materials in the Module Assembly area of the company.

The assembly of the electronic components into the modules is done manually and mechanically. Once the electronic parts have been assembled, they are welded from the bottom by using a "Wave Soldering Machine" or welded on top of the board by using a new technology called Surface Mount Technology (SMT). In the Wave Solder process, a melting paste is used. For the SMT, a solder paste containing lead and tin is used. From the Wave Solder process, waste flux and waste oil are generated. There is a satellite area at the Module Assembly area for accumulation of the waste flux and waste oil. From the SMT, kimwipes impregnated with the solder paste are generated. There is another satellite area for the kimwipes. Waste Methylene Chloride is also generated as a result of the degreasing process of the SMT.

The manufacturing processes generate rinsewaters that are sent to the company's Wastewater Treatment Plant (WWTP). The WWTP treats 200,000 gallons of wastewater per day (g/d). It is designed to precipitate metals from the influents. The precipitated metals are sent to a filter press generating an F006 sludge which is collected in bags and stored at the Hazardous Waste Container Storage Area. An approximate quantity of ten (10) tons of sludge are weekly generated.

The influents to the WWTP are segregated in order to perform three (3) different treatment systems. The treatments are: the Developer/Stripper for treatment of the PCF's organic chemicals non-sanitary influents, Acid rinses for treatment of non-complex metals, and alkaline rinses for treatment of complexed metals. The treatments consists of the following:

1) A reduction - oxidation reaction is first performed to the influents. Potassium Permanganate ($KMnO_4$) is used for oxidation of the organic influents. Lime/polymer is used for oxidation of the acid rinses.

2) Once oxidized the wastewaters are processed in a second reactor using Ferrous Sulfate as a coagulant and Phosphoric acid to maintain a pH between five (5) and six (6).

3) pH adjustment is made using lime 50% and Caustic Soda.

4) The wastewater goes to a flocculation tank and a polymer is added.

5) Then the wastewater goes to a clarifier.

6) The precipitate from the clarifier is passed through a filter press generating F006 sludge.

7) The supernatant from the clarifier is passed through a sand filter. pH adjustment is made in a tank and then the effluent is discharged to PRASA.

The company generates the following hazardous wastes: F006 (electroplating sludge), F007 (Potassium Cyanide), F001 (Methylene Chloride, 1,1,1-trichloroethane), F003 (Acetone), [illegible], [illegible], D001 and D002. The F006 sludge is stored in bags at the Hazardous Waste Container Storage Area (HWCSA) and sent to Phoenix, Arizona or Pennsylvania for metal reclamation. The Ammoniacal Copper Bearing Solution, a D002 waste from the etching process is stored in a Tank Truck and sent to [illegible] Chemical, South Carolina for copper reclamation. The remaining wastes are stored in drums at the HWCSA and sent to Safety Kleen (spent solvents) and Rolling Environmentals, Louisiana (filters) for incineration.

However, the company annually updated the changes in its manufacturing processes and notify them. Digital submitted on October 27, 1989 its last revised Notification of Hazardous Wastes Activity and notified the following: F001, F003, F006, D001, D002, [illegible] and X01 as a process.

For collection of spills, the company has a spill team which uses neutralizers and pads. Pads are collected into drums and discarded as hazardous wastes. Also the company has a collection trenches system inside the PCF that discharge to the WWTP.

During the Visual Site Inspection performed on February 2[illegible], 1990, the following areas were inspected:

1) <u>Ignitable Wastes Container Storage Area</u> - The unit is active since 1987. It consists of a 5' x 10" structure 1-fenced side, 2-wood sides, 1-concrete side with a zinc-roof. Its containment system consists of a 6 inches-concrete dike. The area is grounded, it has two signs: one reads Flammable and the other one reads Residuum Chemicals Storage. The unit is watched 24 hours with a camera. Any spill is collected with pumps and

absorbent material. At the time of the inspection, there was a drum of Waste Flammable Liquid N.O.S. Flux stored over a wood pallet. The company stored the Ignitable wastes for less than [illegible] days, approximately one (1) month. The area will be closed and included in the Closure Plan of the HWCSA (refer to photo no. [illegible] on attachment no. [illegible]).

2) Hazardous Waste Container Storage Area (HWCSA), to be closed - The unit is active since approximately 1973. At the beginning, Ignitable Wastes were not segregated from the other hazardous wastes. Prior to 19[illegible], the F006 sludge was not stored at the HWCSA; storage tanks located at the Wastewater Treatment Plant were used instead. Since 19[illegible], the HWCSA has three (3) sections: one for the F006 sludge cake that started to be filtered-press; one for the corrosives D002 and spent solvents; and other section for storage of waste Flux and D008/F001 waste which is currently used for storage of raw material since this section does not comply with the 50-feet requirement. Each section has its own pit, dike a slope-entrance and zinc-roof. The unit has a telephone, a safety eyewash and a safety shower. The unit has a kit for minor spills, pumps, and a neutralization system. At the southwest of the unit, there is an automatic finger for management of Hazardous Waste drums. There is no visual evidence of spills. Refer to photo no. 1 on Attachment no. 2.

3) New Hazardous Waste Container Storage Area (New HWCSA) - The unit has three sections: one for sludge storage, one section for storage of Flammable and Waste Oil, and the other section for storage of Spent Filters, D002, and other wastes. Each section has a drain inside, a close-valve and a sumpit outside. Each section room is half wall-half fence, has iron door, zinc-roof, automatic spinklers, and sloped entrance. The concrete floor has a special coating, sulphuric acid-proof and one foot of thickness. The areas are grounded. At present, the unit is being used for storage of raw materials. There is a concrete pathway for transferring of the containers to the area (refer to photos no. 5, 7 and 9 on attachment no. 2).

4) Tank Farm - The tank farm consists of one 8,000 gal. tank for storage of caustic soda (raw material) and one empty tank. The caustic soda is used for pH adjustment at the WWTP. The 8,000 gal-tank shows signs of corrosion. The empty tank was used for storage of Butyl Cellosove (raw material) till 1987. The company plans to utilize the empty tank for storage of any spill event. The tank farm is surrounded by a concrete dike, 3-4 feet high with an open-side as an entrance which has a ramp and a collection trench. Near the tank farm there are two (2) 300 gal-tanks for storage of Diesel used for the emergency generators. The tanks have have their own dike.

5) Mecer Unit - The Mecer Unit located at the east of the facility is where the etchant solution is regenerated. Spent etchant solution with copper (blue color) enters the unit; copper is separated from the etchant solution; the copper is plated and the etchant is recovered. The copper comes out as a plate which is sold. The Mecer Unit is fed from two tanks located run the unit. One of the tank stored spent etchant and the other one stored used rinse water (Ammonia Copper Bearing Solution). The tanks area is surrounded by a dike (refer to photos no. 11 and 13 on Attachment 2). If the Mecer Unit is down, a tank truck is placed beside the unit to collect the waste from the Spent Etchant Tank and sent to CP Chemical, South Carolina for copper reclamation.

From the Mecer Unit, the regenerated etchant is stored in a 9,000-gallon tank located on the East of the facility near the Diesel Underground Storage Tank Area (refer to photo no. 19 on Attachment 2).

The Mecer unit has an emergency pump which in case of overflow, the pump is activated to return the overflow to the unit. The pump system was installed on 1987 after a spill event.

6) Diesel Underground Storage Tanks Area - The area located at the East of the facility had four underground storage tanks that were removed on 1989. Two above ground of 12,000-gallon capacity each were placed instead. Both tanks are placed over a concrete base and surrounded by a concrete dike (refer to photo no. 17 on Attachment no. 2). The soil of the area is contaminated with hydrocarbons and a remedial action has been implemented.

7) Wells - The wells piping system is located to the East of the facility and connected to a 25,000-gallon tank. The water level in the tank is kept with city water through a 4-inches pipe-line. The well water is passed through a carbon activated filter and then it enters as raw water to the WWTP to be processed as soft and deionized water.

8) Groundwater Recovery Well - It is located to the northwest side of the facility. It is used to collect groundwater for its treatment at the WWTP as a contingency plan. This action was taken because the company found that the groundwater beneath it has high copper concentration. Therefore, the company decided to analyze monthly for metals.

9) Electroless Area - At this manufacturing area, there is a copper recovery system. The system consists of a close loop filter system. The water is reused and no longer discharged to the WWTP.

10) **Carbon Treatment** at the Electroplating Area - The carbon treatment system consists of a close-loop of a carbon-activated filter bag to polish the tin-lead solution prior to be used on the Electroplating process. The area has a trenches system to collect spills. The carbon-activated filter bags are discarded as hazardous wastes.

11) Electroplating Area - The metal baths do not generate any sludge as per Mr. Serrano indications. All of the electroplating baths are surrounded by a trenches system connected to the WTP. The lead baths consist of a lead bag in an anode in a fluoboric acid media. Circuit Boards scrap to be sold is accumulated at the area.

12) Filter System for Regeneration of Tin-Lead inside the Electroplating Room - Different filters units are located along the Electroplating area. The spent Tin-Lead solution from the electroplating baths are regenerated through the filters. The spent filters are discarded as hazardous wastes (refer to photo no. 21 on Attachment no.2).

13) Satellite Area inside the Electroplating Room - Inside the electroplating area, there is a segregated area for accumulation of drums containing spent filters from the Tin-Lead regeneration system. The filters are corrosive since an acidic media is used in the filters system. At the time of inspection, there were four drums being filled placed over a wood pallet. Also, drums containing metal scrap were at the area (refer to photos no. [illegible] and 2[illegible] on Attachment no. 2).

14) Wastewater Treatment Plant - The new Wastewater Treatment Plant starts to operate in 1988. The plant was constructed in order to comply with the new PRASA Pre-treatment regulations. The influents are segregated into three streams: metal-complex rinses, metal-non complex rinses, and Developer/Stripper stream for organic solutions.

Tanks of the Wastewater Treatment Plant are made of reinforced steel with a special coating. Each tank consists of a double-tank system with a collection and a trench system.

All the precipitated metals from the clarifiers are combined in a holding tank (3,000 gallon capacity) to feed the filter press (refer to photos no. 29 and 31 on Attachment no. 2). At the time of the inspection on February 20, 1990, the filter press was leaking sludge water some of which reached the concrete outside the plant. The holding tank, TK-23, was formerly used for storage of F006 sludge prior to out-site disposal. The holding tank is an on-ground tank, placed on the concrete floor with a nearby trench.

Another tank used currently for filters backwash was also formerly used for storage of F006 sludge prior to out-site disposal (refer to photo no. 7 on Attachment no. 2).

There is a Batch Treatment tank, [illegible] gallon capacity which is used in case of accidental spills and to collect water from the trenches system.

15) <u>Satellite Area at the Wastewater Treatment Plant</u> - There is a safety cabinet located at the Wastewater Treatment Plant that is used for storage of flux waste and spent oil. At the time of the inspection on February [illegible], 19[illegible], there were two fifty-five gallon drums, one of them containing Flux waste and the other one containing waste oil. There were also four safety cans containing Waste flammable from processes lines and others containing Freon and Methylene Chloride (refer to photo no. 13 on Attachment 2). The flux waste is generated at the Hot Lever Solder Room where there is a flux both.

16) <u>Satellite Areas at the Module Assembly Room</u> - There are two satellite areas: one at the Wave Solder Area and the other one at the Surface Mount Area. The Wave Solder Satellite Area is used for accumulation of waste flux and spent oil. The Surface Mount Satellite Area is used for accumulation of kimwipes impregnated with a Lead solder paste (D008 waste).

Several company's files were revised including: the Inspection Logbook of the Hazardous Waste Storage Area, the Hazardous Waste Storage Area Daily Log Sheet, Removal from Storage Record, the Wastewater Treatment Logbook, and the analysis Report of Groundwater wells.

A closing - meeting was conducted among the EQB personnel and Mr. Serrano and Mr. Abadía from Digital in order to discuss the remedial action plan at the Underground Tanks Area.

Three (3) Kodak film of twelve (12) exposures each were taken with a Nikon FG Camera.

Should you have any comment or question regarding this inspection, please contact the subscriber.

ATF/aas

cc: Mr. James Reidy, US EPA Region II